India's International Trade of Four Specific Commodities in the Recent Past

Some Insights

Preface

The study uses trade indicators to analyse merchandise export and import data in a way that should be useful for the purpose of policy. The indicators provide a glimpse of the trade patterns of the world and the performance of India in comparison to various other countries. They have been used in the case of India's exports of **Semi-Finished Product of Iron or Non-Alloy Steel & Ion Exchangers Polymers** and imports of **Copper Waste and Scrap and Carbonates ; Per Carbonates** to indicate the possible directions policy may take. The data used in this study has been sourced from the Export Import Data Bank of the DGCI&S, Department of Commerce, and Government of India and from the United Nations Comtrade Database. Introduction notes of each commodities has been sourced from the various sights –viz Wikipedia, Britannica, The Economic Times etc.

Computations are based on data at ITC-HS four-digit level (ITC-HS Code-**7207** & **3914** for export and **7408** & **2836** for import) and the latest finalized data available on the UN Comtrade Database up to year 2020 and on the DGCI&S Database up to June'2022. So, trends from 2017 to 2020 have been shown when we extract the data from UN Comtrade and from 2018 to 2021 have been shown when we extract the data from DGCIS Data base. In this report, we will see various analysis and aspects of India's Precious as well as International export trade of Semi-Finished Product of Iron or Non-Alloy Steel & Ion Exchangers Polymers and imports of Copper Waste and Scrap and Carbonates ; Per Carbonates**.** We will use both the 4 digit Commodity codes.Trends in India's as well as International Trade i.e. Exports and Imports of above four Commodities are given below in different tables :

- **Table 1 : India's top 10 Export destination of Semi-finished Products of Iron or Non-Alloy Steel with their shares in percentage.**
- **Table 2 : World's top 10 Exporters of Semi-finished Products of Iron or Non-Alloy Steel with their shares in percentage.**
- **Table 3 : World's top 10 Importers of Semi-finished Products of Iron or Non-Alloy Steel with their shares in percentage.**
- **Annex- I : Top 3 sources of Semi-finished Products of Iron or Non-Alloy Steel of World's top 3 Importers.**
- **Table 4 : India's top 10 destination of Ion Exchanger Polymers with their shares in percentage.**
- **Table 5 : World's top 10 Exporters of Ion Exchanger Polymers with their shares in percentage.**
- **Table 6 : World's top 10 Importers of Ion Exchanger Polymers with their shares in percentage.**
- **Annex-II : Top 3 sources of Ion Exchanger Polymers of World's top 3 Importers.**
- **Table 7 : India's top10 Sources of Copper Waste and Scrap with their shares in percentage.**
- **Table 8 : World's top 10 Importers of Copper Waste and Scrap with their shares in percentage.**
- **Table 9 : India's top 10 Sources of Carbonates with their shares in percentage.**
- **Table 10 : World's top 10 Importers of Carbonates with their shares in percentage.**

1

EXPORT

Semi finished products of Iron or non alloy Steel

Iron ore materials (IOM) are produced by processing iron ore and intended for further use in the iron and steel industry. They are a source of Fe for ferroalloy and pig iron production in blast furnaces, direct reduced iron (DRI) production and hot briquetted iron (HBI) production. The main types of iron ore materials include concentrate, pellets and sinter.

Pig iron is iron alloy containing carbon (> 2.14% C) and other elements. Its excellent casting properties mean that it is widely used in casting for various applications, as well as in steelmaking.

Steel is a multicomponent metal containing primarily ferrum (Fe), carbon (from 0.025% to 2.14%), additives and alloys. Semi-finished steel products include square billets, blooms, beam blanks, slabs and rounds that are used to hot-roll sections, flat products and pipes.

Iron ore materials are produced at enrichment works by mining, preparing and enriching iron ore. Ore processing includes crushing (grinding), increasing Fe content by removing gangue and detrimental impurities, drying, palletising and roasting pellets to produce iron ore materials of the required size and strength.

Pig iron is produced in blast furnaces by reducing iron oxides contained in iron ore materials using elements derived from fuel combustion (carbon oxide, hydrogen and solid carbon). As a result of the blast furnace process, carbon-rich hot metal and slag consisting of non-reduced oxides, fuel ash, flux, etc, are produced. Hot metal goes to steelmaking shops to produce steel; foundry shops to produce castings; and pig-casting machines to produce pig iron.

One of three types of furnace is used to produce steel: namely, basic oxygen, open hearth or electric arc furnaces. Each method includes material preparation, steelmaking at melting units, secondary metallurgy and casting. Hot metal or pig iron, scrap steel or iron, and ferroalloys are used as feedstock. End products of steelmaking include steel semis that are cast at continuous casting machines (casters) or teemed into ingots with further re-rolling at hot blooming or slabbing mills. Depending on the shape, size and application, semi-finished products are classified into:

- Slabs – semis with rectangular cross-sections and big aspect ratios for producing flats and coils.
- Blooms – semis with square (sides greater than 200 mm) or near-square cross-sections for rolling heavy sections.
- Square billets – semis of square cross-sections with sides up to 200 mm for hot-rolling medium and light sections.
- Beam blanks – semis for rolling wide flange beams.
- Rounds - semis for producing seamless pipes and axles.

These are broadly classified under H.S. Code-7207.

Table - 1

India's Top 10 destination of Semi-Products of Iron or Non Alloy Steel (H.S Code-7207)

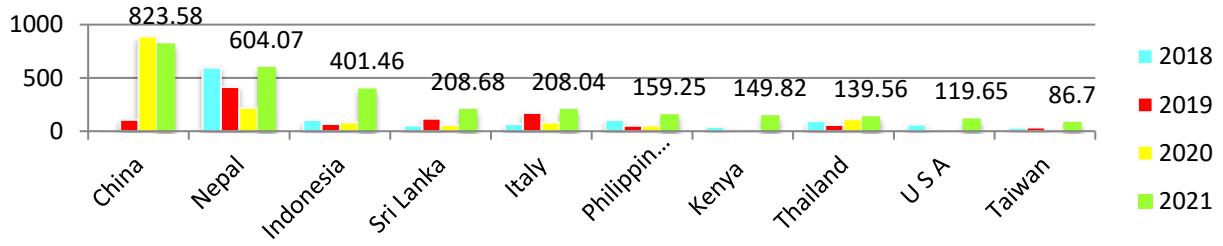
Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	0.01	0.00	107.25	9.37	889.09	54.09	823.58	26.40
2.	Nepal	595.48	48.40	413.82	36.15	217.42	13.23	604.07	19.36
3.	Indonesia	104.91	8.53	67.03	5.85	82.73	5.03	401.46	12.87
4.	Sri Lanka	53.59	4.36	117.88	10.30	57.82	3.52	208.68	6.69
5.	Italy	66.80	5.43	171.68	15.00	81.56	4.96	208.04	6.67
6.	Philippines	105.12	8.54	51.80	4.53	53.05	3.23	159.25	5.10
7.	Kenya	40.71	3.31	14.69	1.28	11.73	0.71	149.82	4.80
8.	Thailand	94.71	7.70	58.52	5.11	112.02	6.81	139.56	4.47
9.	U S A	61.34	4.99	11.71	1.02	0.02	0.00	119.65	3.83
10.	Taiwan	31.37	2.55	34.71	3.03	19.56	1.19	86.70	2.78
	Others	76.33	6.20	95.77	8.36	118.74	7.22	219.25	7.03
	Total	1230.35	100	1144.84	100	1643.73	100	3120.06	100

Source: DGCI&S.

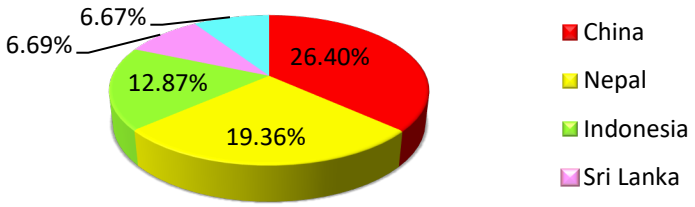
Note : India's Export including re-export

Top importers of Semi-Finished Products of Iron or Steel from India from 2018-2021**(in Million USD)**

Data label given on the basis of 2021



India's top 5 destinations of Semi-Finished Products of Iron or Steelby percentage India in 2021:



In the year 2021, The total export value of Semi-Finished Products Of Iron Or Non Alloy Steel from India was US $ 3.12 Billion and riches pick in this year, showing the rise of nearly 2 times compared to the year of 2020. China was the largest destination of Semi-Finished Products of Iron or non-Alloy Steel from India in 2021. It has imported US $ 823.58 Million in 2021, accounted 26.40% share of India's total export. Nepal and Indonesia stood at 2nd and 3rd largest destination of Semi-Finished Products of Iron or Non-Steel form India with 19.36% and 12.87% share respectively of India's total export of the same in the same year. The review shows that Nepal was top destination of the products for two consecutive years from 2018 to 2019.

Table-2

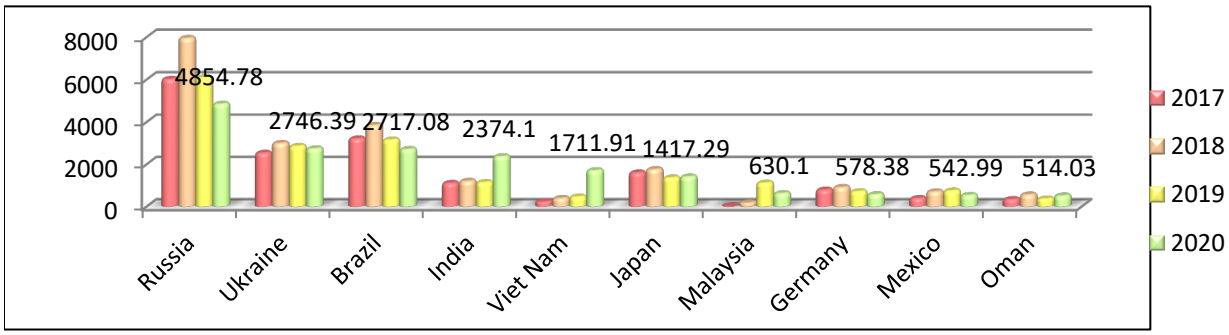
World's Top 10 exporter of Semi-Products of Iron or Non Alloy Steel (H.S Code-7207)

Rank	Countries	2017		2018		2019		2020	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Russia	6028.93	26.34	7957.14	28.41	6100.34	26.59	4854.78	22.24
2.	Ukraine	2541.54	11.10	3002.95	10.72	2860.00	12.47	2746.39	12.58
3.	Brazil	3220.28	14.07	3857.18	13.77	3161.31	13.78	2717.08	12.45
4.	**India**	**1115.12**	**4.87**	**1210.33**	**4.32**	**1147.70**	**5.00**	**2374.10**	**10.88**
5.	Viet Nam	240.31	1.05	398.31	1.42	466.64	2.03	1711.91	7.84
6.	Japan	1609.39	7.03	1766.10	6.31	1366.15	5.96	1417.29	6.49
7.	Malaysia	23.24	0.10	191.93	0.69	1118.43	4.88	630.10	2.89
8.	Germany	796.66	3.48	919.99	3.28	715.37	3.12	578.38	2.65
9.	Mexico	397.50	1.74	713.01	2.55	749.60	3.27	542.99	2.49
10.	Oman	347.99	1.52	567.95	2.03	371.47	1.62	514.03	2.35
	Others	6568.84	28.70	7425.02	26.51	4882.70	21.28	3743.52	17.15
	Total	22889.80	100	28009.90	100	22939.71	100	21830.56	100

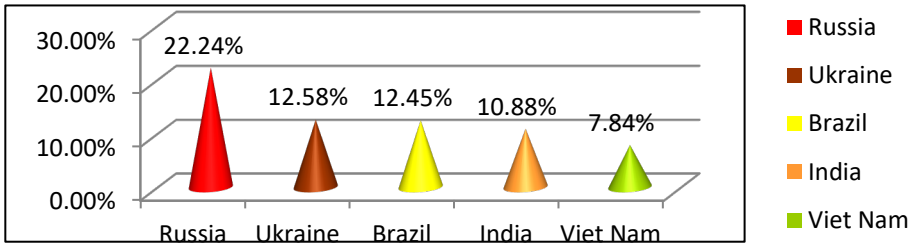
Source: UN Comtrade

World's Leading Exporters of Semi-finished products of iron or steel from 2017 to 2020 (**million USD)**

Data label given on the basis of 2020



Country wise world's top 5 exporter of Semi-finished products of iron or steel by percentage in 2020 :



In 2020, the world imports of Semi-finished products of iron or non-alloy steel was US $21.83 billion. It was US $ 23 billion in 2019. Russia was the world's largest exporter of Semi-finished products of iron or non-alloy steel in 2020, it has exported US $ 4.85 Billion of the commodity, which was accounted 22.24% share of world export. Which was followed by Ukraine (12.58%) and Brazil(12.45%). In the same year India constitutes the 4th largest exporter of Semi-finished products of iron or non-alloy steel in the world with 10.88% share of world's export of Semi-finished products of iron or non-alloy steel .

Table-3

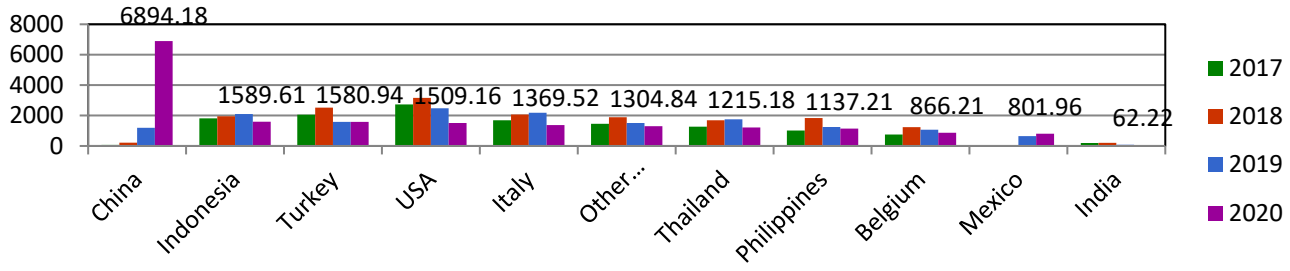
World's top 10 Importers of Semi-Products of Iron or Non Alloy Steel (H.S Code-7207)

Rank	Countries	2017		2018		2019		2020	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	69.75	0.28	212.81	0.70	1196.12	4.51	6894.18	27.02
2.	Indonesia	1810.89	7.29	1953.97	6.41	2094.46	7.90	1589.61	6.23
3.	Turkey	2053.32	8.27	2519.98	8.27	1582.52	5.97	1580.94	6.20
4.	USA	2735.09	11.01	3162.40	10.37	2482.03	9.36	1509.16	5.92
5.	Italy	1693.03	6.82	2063.89	6.77	2183.66	8.23	1369.52	5.37
6.	Other Asia,nes	1456.94	5.87	1893.59	6.21	1507.69	5.69	1304.84	5.11
7.	Thailand	1264.94	5.09	1690.23	5.54	1757.31	6.63	1215.18	4.76
8.	Philippines	1016.16	4.09	1836.33	6.02	1244.07	4.69	1137.21	4.46
9.	Belgium	748.49	3.01	1236.36	4.06	1067.45	4.03	866.21	3.40
10.	Mexico	11.37	0.05	11.72	0.04	647.32	2.44	801.96	3.14
42.	**India**	**190.82**	**0.77**	**210.78**	**0.69**	**84.00**	**0.32**	**62.22**	**0.24**
	Others	11781.98	47.45	13693.83	44.92	10671.10	40.24	7182.06	28.15
	Total	24832.79	100	30485.89	100	26517.73	100	25513.11	100

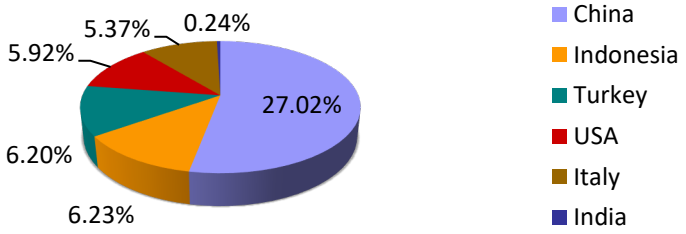
Source : UN Comtrade

World's top Semi-finished products of iron or steel importers from 2017 to 2020 **(in million USD)**

Data label given on the basis of 2020



Country wise world's leading importers of Semi-finished products of iron or steel by percentage in 2020

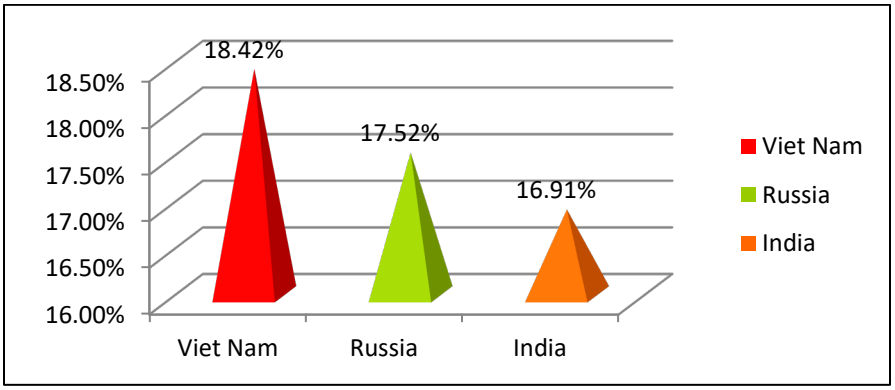


The value of global imports of Semi-finished products of iron or non-steel totalled US $ 25.51Billion in 2020. Which was decreased by nearly 4% in value terms compared to 2019. Global Semi-finished products of iron or non-steel import peaked of US $ 30.48 Billion in 2018. China represented the major importer of Semi-finished products of iron or non-alloy steel in the world, recording US $ 6.89 Billion, which was 27.02% of total global imports in 2020. Indonesia and Turkey stood at 2nd and 3rd position with 6.23% and 6.20% share of world import. **India** occupied a 0.24% share of global Semi-finished products of iron or steel imports, which put it in 42nd place in the world in 2020.

Annexure-1

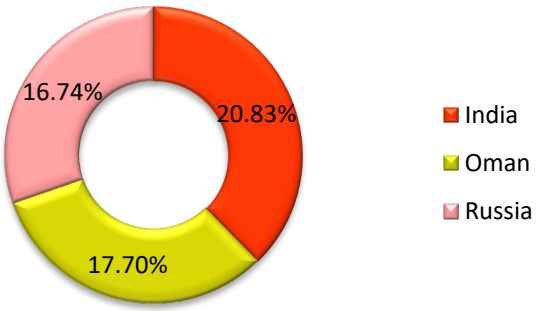
Sources of world's top 3 importers of Semi-Products of Iron or Non Alloy Steel (H.S Code-7207)

i) Top 3 Sources of Semi-Finished Product of Iron or Steel to China in 2020 by percentage:



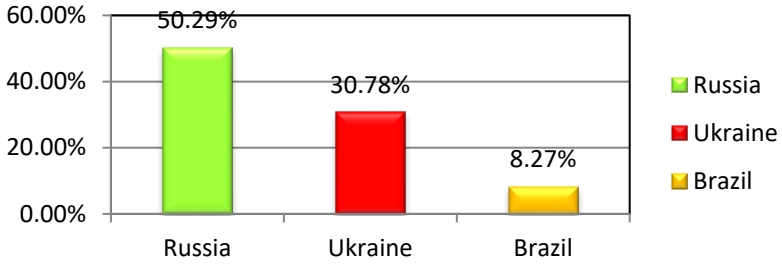
China has imported 18.42% share of Semi-Finished Products of Iron or Non-Alloy Steel from Viet Nam,17.52% from Russia and 16.91% share of its total import of Semi-Finished Products of Iron or Non-Alloy Steel from India in 2020. **Source : UN Comtrade)**

ii) Top 3 Sources of Semi-Finished Product of Iron or Steel to Indonesia in 2020 by percentage*:*



India was the primary source country of Semi-Finished Products of Iron or Non-Alloy Steel to Indonesia, exports 20.83% share of Indonesia's total import in 2020. Oman (17.70%) and Russia (16.74%) were other important sources of Semi-Finished Products of Iron or Non-Alloy Steel to Indonesia in 2020. **Source : UN Comtrade)**

iii) Top 3 Sources ofSemi-Finished Product of Iron or Steel to Turkeyin 2020 by percentage*:*



Turkey's 3 major source countries of Semi-Finished Products of Iron or Non-Alloy Steel in 2020 were Russia (50.29%),Ukraine (30.78%) and Brazil (8.27%).India has almost no account to Turkey in that year. **(Source: UN Comtrade).**

Ion exchanger of Polymer in Primary form

An **ion-exchange** is a resin or polymer that acts as a medium for ion exchange. It is an insoluble matrix (or support structure) normally in the form of small (0.25–1.43 mm radius) microbeads, usually white or yellowish, fabricated from an organic polymer substrate. The beads are typically porous, providing a large surface area on and inside them where the trapping of ions occurs along with the accompanying release of other ions, and thus the process is called ion exchange. There are multiple types of ion-exchange resin. Most commercial resins are made of polystyrene sulfonate.

Ion-exchange Polymers are widely used in different separation, purification, and decontamination processes. The most common examples are water softening and water purification. In many cases ion-exchange resins were introduced in such processes as a more flexible alternative to the use of natural or artificial zeolites. Also, ion-exchange resins are highly effective in the biodiesel filtration process.

Most typical ion-exchange resins are based on crosslinkedpolystyrene. The actual ion-exchanging sites are introduced after polymerisation. Additionally, in the case of polystyrene, crosslinking is introduced by copolymerisation of styrene and a few percent of divinylbenzene. Crosslinking decreases ion-exchange capacity of the resin and prolongs the time needed to accomplish the ion-exchange processes but improves the robustness of the resin. Particle size also influences the resin parameters; smaller particles have larger outer surface, but cause larger head loss in the column processes.

Besides being made as bead-shaped materials, ion-exchange Polymers are also produced as membranes. These ion-exchange membranes, which are made of highly cross-linked ion-exchange resins that allow passage of ions, but not of water, are used for electrodialysis.

Ion-exchange resins are used to replace the magnesium and calcium ions found in hard water with sodium ions. When the resin is fresh, it contains sodium ions at its active sites. When in contact with a solution containing magnesium and calcium ions, the magnesium and calcium ions preferentially migrate out of solution to the active sites on the resin, being replaced in solution by sodium ions. The resin can be recharged by washing it with a solution containing a high concentration of sodium ions. The calcium and magnesium ions migrate from the resin, being replaced by sodium ions from the solution until a new equilibrium is reached. The salt is used to recharge an ion-exchange resin, which itself is used to soften the water.

Ion-exchange Polymers are used to remove poisonous (e.g. copper) and hazardous metal (e.g. lead or cadmium) ions from solution, replacing them with more innocuous ions, such as sodium and potassium. Few ion-exchange resins remove chlorine or organic contaminants from water – this is usually done by using an activated charcoal filter mixed in with the resin. There are some ion-exchange resins that do remove organic ions, such as MIEX (magnetic ion-exchange) resins. Water of highest purity is required for electronics, scientific experiments, production of superconductors, and nuclear industry, among others. Such water is produced using ion-exchange processes or combinations of membrane and ion-exchange methods.

Ion-exchange processes are used to separate and purify metals, including separating uranium from plutonium and other actinides.

Ion-exchange Polymers are used in the manufacturing of pharmaceuticals, not only for catalyzing certain reactions, but also for isolating and purifying pharmaceutical active ingredients. Three ion-exchange resins, sodium polystyrene sulfonate, colestipol, and cholestyramine, are used as active ingredients. Sodium polystyrene sulfonate is a strongly acidic ion-exchange resin and is used to treat

hyperkalemia. Colestipol is a weakly basic ion-exchange resin and is used to treat hypercholesterolemia. Cholestyramine is a strongly basic ion-exchange resin and is also used to treat hypercholesterolemia. Colestipol and cholestyramine are known as bile acid sequestrants.

These are broadly classified under **H.S. Code-3914.**

Table – 4

India's Top 10 destination of Ion Exchanger of Polymers in Primary Form (H.S Code-3914)

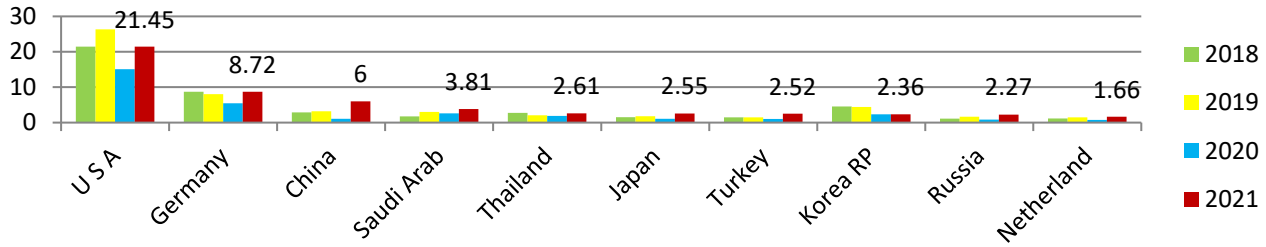
Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	U S A	21.46	33.81	26.33	37.05	15.09	34.91	21.45	29.13
2.	Germany	8.69	13.69	8.03	11.31	5.45	12.61	8.72	11.84
3.	China	2.90	4.57	3.20	4.51	1.07	2.47	6.00	8.15
4.	Saudi Arab	1.73	2.73	3.00	4.22	2.60	6.00	3.81	5.18
5.	Thailand	2.73	4.30	2.09	2.94	1.91	4.43	2.61	3.54
6.	Japan	1.53	2.41	1.81	2.55	1.08	2.49	2.55	3.47
7.	Turkey	1.50	2.37	1.50	2.12	1.04	2.41	2.52	3.42
8.	Korea RP	4.55	7.16	4.44	6.24	2.35	5.44	2.36	3.20
9.	Russia	1.11	1.76	1.66	2.34	0.84	1.93	2.27	3.09
10.	Netherland	1.16	1.83	1.48	2.08	0.74	1.72	1.66	2.26
	Others	16.11	25.38	17.52	24.66	11.06	25.59	19.69	26.73
	Total	63.47	100	71.06	100	43.22	100	73.65	100

Source: DGCI&S

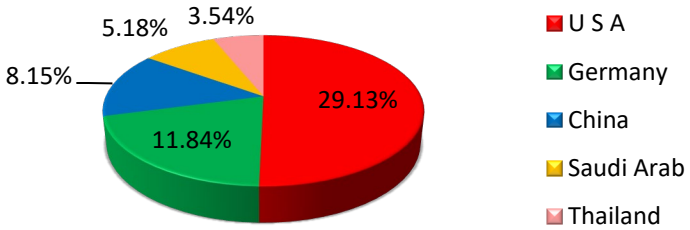
Note : India's Export including re-export

India's major destination Ion-exchange Polymers from 2018-2021**(Values in million USD)**

Data label given on the basis of 2021



India's top 5 destinations of Ion-exchange Polymers by percentage in 2021:



In the year 2021, India has exported Ion Exchangers Based On Polymers In Primary Forms worth of US $ 73.65 million showing the rise of 70% compared to the year 2020 and rise of 12% compared to the year

2018. USA is the largest destination for Ion Exchangers Based On Polymers In Primary Forms export from India. In 2021, USA imported US $ 21.45 Million or 29.13% of Ion Exchangers Based On Polymers In Primary Forms from India. Followed by Germany and China with 11.84% and 8.15 % share of India's total export of Ion Exchangers Based On Polymers In Primary Forms in 2021.

Table - 5

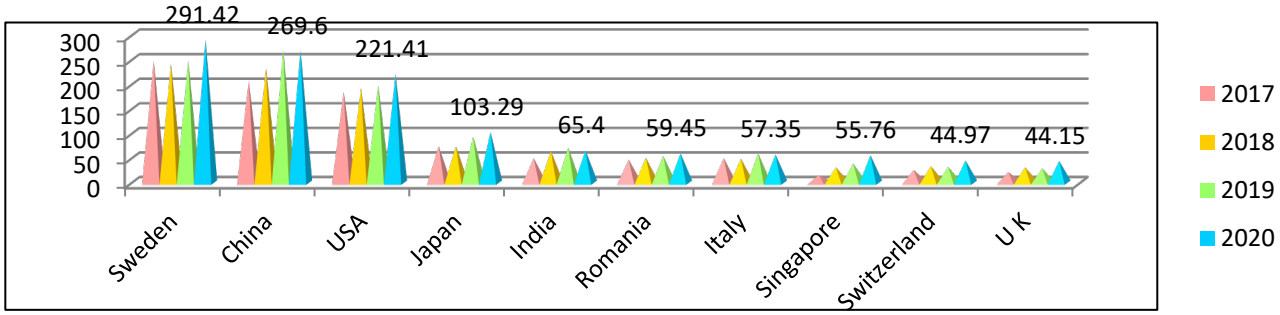
World's Top 10 exporter of Ion Exchanger of Polymers in Primary Form (H.S Code-3914))

Rank	Countries	2017		2018		2019		2020	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Sweden	247.16	19.95	242.45	20.59	248.13	19.65	291.42	20.91
2.	China	207.58	16.75	233.63	19.84	270.06	21.39	269.60	19.35
3.	USA	185.02	14.93	192.81	16.37	197.86	15.67	221.41	15.89
4.	Japan	74.40	6.01	74.07	6.29	93.71	7.42	103.29	7.41
5.	**India**	**49.67**	**4.01**	**63.84**	**5.42**	**71.08**	**5.63**	**65.40**	**4.69**
6.	Romania	46.97	3.79	50.31	4.27	54.28	4.30	59.45	4.27
7.	Italy	50.08	4.04	48.57	4.12	59.53	4.71	57.35	4.12
8.	Singapore	15.11	1.22	30.97	2.63	38.83	3.07	55.76	4.00
9.	Switzerland	25.84	2.09	33.30	2.83	32.01	2.53	44.97	3.23
10.	U K	21.53	1.74	31.01	2.63	28.79	2.28	44.15	3.17
	Others	170.65	13.77	176.69	15.00	168.47	13.34	180.62	12.96
	Total	1238.98	100	1177.66	100	1262.76	100	1393.42	100

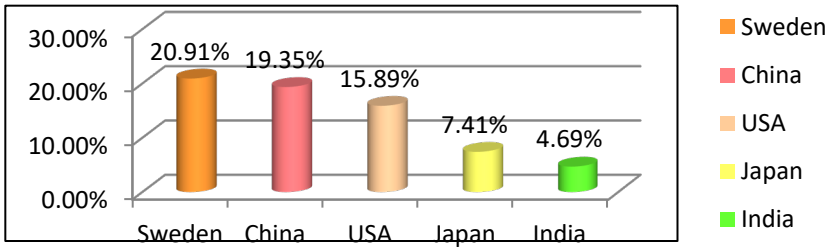
Source: UN Comtrade

Top world exporters of Ion-exchange Polymers from 2017 to 2020 **(Values in million USD)**

Data label given on the basis of 2020



Export trends in world's leading Ion-exchange Polymers exporters by percentage in 2020:



The total export value in the world for Ion exchangers based on polymers in primary forms was US $ 1.40 Billion in 2020. Which was rise of 10% compare to the year 2019. The largest exporter of Ion exchangers

based on polymers in primary forms in the world was Sweden , exported US $ 291.42 Million worth of the commodity in 2020. Other top countries which export Ion exchangers based on polymers in primary forms were China (U$ 269.60 Million), USA (US $ 221.41Million). In the same year **India** has exported US $ 65.40 Million of Ion- exchangers of polymers which was accounted 4.69% of world export.

Table - 6

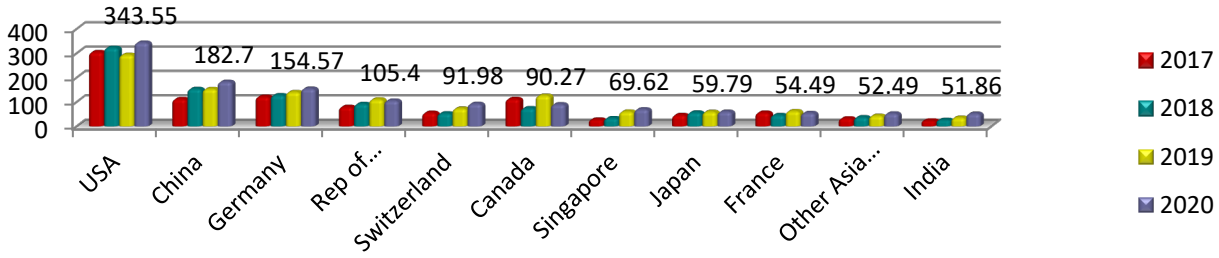
World's top 10 Importers of Ion Exchanger of Polymers in Primary Form (H.S Code-3914)

Rank	Countries	2017		2018		2019		2020	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	USA	304.85	19.39	322.54	19.67	293.59	16.01	343.55	17.29
2.	China	111.97	7.12	153.56	9.37	152.98	8.34	182.70	9.20
3.	Germany	121.61	7.73	127.77	7.79	140.43	7.66	154.57	7.78
4.	Rep of Korea	79.98	5.09	91.67	5.59	110.12	6.00	105.40	5.31
5.	Switzerland	55.62	3.54	53.04	3.24	72.83	3.97	91.98	4.63
6.	Canada	112.43	7.15	74.29	4.53	125.92	6.87	90.27	4.54
7.	Singapore	27.30	1.74	33.17	2.02	60.21	3.28	69.62	3.50
8.	Japan	46.43	2.95	56.71	3.46	59.38	3.24	59.79	3.01
9.	France	56.01	3.56	46.09	2.81	62.07	3.38	54.49	2.74
10.	Other Asia nes	32.21	2.05	37.21	2.27	43.26	2.36	52.49	2.64
11.	**India**	**23.11**	**1.47**	**25.78**	**1.57**	**35.37**	**1.93**	**51.86**	**2.61**
	Others	600.87	38.21	617.64	37.67	677.94	36.96	730.05	36.75
	Total	1572.40	100	1639.48	100	1834.09	100	1986.77	100

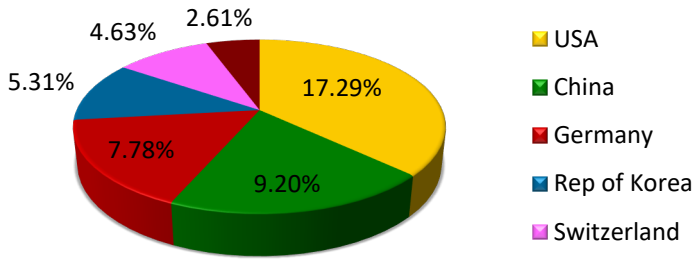
Source :UNComtrade

Top world importers of Ion-exchange Polymers from 2017 to 2020 **(Values in million USD)**

Data label given on the basis of 2020



Country wise leading global Importer of Ion-exchange Polymers by percentage in 2020



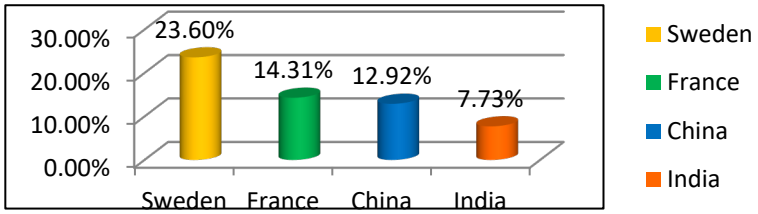
In 2020, Ion exchangers based on polymers were the world's most traded product, with a total import trade of US $ 1.98B. Between 2019 and 2020 the imports of Ion exchangers based on polymers grew by

7.58%, from US $ 1.83B to US $ 1.98B. USA was the largest importer of the commodity. USA has imported US $ 343.55 million, accounted 17.29% of world's total import in 2020. It was followed by China and Germany with share of 9.20% and 7.78% of world import respectively in that year. In the same year India has imported US $ 51.86 million worth value of Ion-exchangers of polymers, accounted 2.61% of world import and stood at 10th position in ranking in the world.

Annexure-II

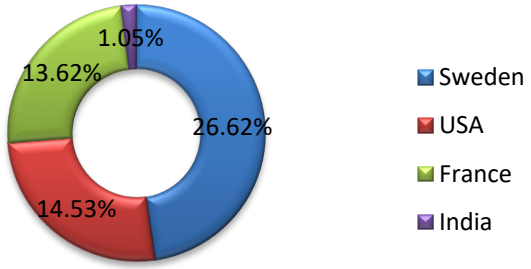
Sources of world's top three importers of Ion-Exchanger of Polymers(H.S Code-3918)

i) Top 3 Sources of Ion-Exchanger of Polymers to USA in 2020 by percentage:



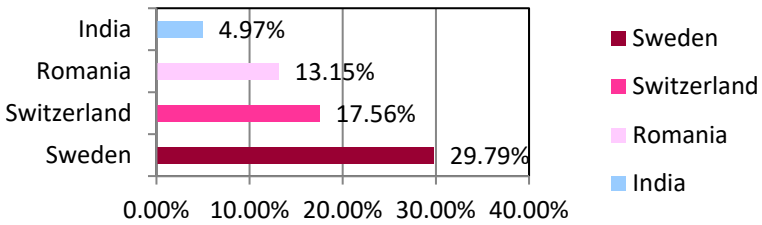
In the year 2020 USA, USA imported 23.60% of its total import of Ion Exchangers Based On Polymers In Primary Forms from Sweden. Followed by France (14.31%) and China(12.92%).**India** also was a important source country of the commodity to USA. USA has imported 7.73%of Ion-exchanger of Polymers from India in 2020. **(Source: UN Comtrade)**

ii) Top 3 Sources ofIon Exchanger of Polymers to China in 2020 by percentage**:**



China has imported most of its Ion-Exchanger of Polymers from Sweden, imports 26.62% share of its total import from Sweden, 14.53% share from USA and 13.62% share of Ion-Exchange Polymers from France in 2020. In the same year **India** has exported only 1.05% share of China's Total import of Ion-Exchanger Polymers.**(Source: UN Comtrade)**

iii) Top 3 Sources of Ion-Exchanger of Polymers to Germany in 2020 by percentage**:**



Sweden was the largest source country of Ion-Exchangers Polymers to Germany in 2020, Germany imports, 29.79% share of its total import of Ion-Exchangers Polymers from Sweden in 2020. 17.56% from Switzerland and 13.15% from Romania. In the same year Germany has imported 4.97% share of its import of Ion-Exchangers Polymers from **India**.**(Source : UN Comtrade)**

IMPORT

Copper Waste and Scrap

Copper scrap is smelted in primary (concentrate) and secondary (scrap) smelters. Primary smelters mainly smelt concentrate. Some, however, are well adapted to smelting all grades of scrap.

Scrap is also extensively recycled to the converters in primary smelters. The heat from the converter's exothermic Fe and S oxidation reactions is particularly useful for melting scrap, especially if considerable oxygen is used for the oxidation reactions.

Secondary scrap smelters primarily use TSL furnaces and TBRCs for smelting low-Cu grade scrap. The main smelting product is molten black copper (80% Cu), which is converted to rough copper (96% Cu) then fire refined and cast into anodes (98.5% Cu).

These processes do not completely remove Ni and Sn from Cu, so the refining furnace product must be electrorefined. Electrorefining also recovers Ag, Au, and Pt group metals.

Secondary copper refining is similar to primary copper refining. However, scrap may contain more impurities than concentrates so larger electrolyte purification and slimes treatment facilities may be required.

copper scrap varies in grade from 99.5+% Cu (manufacturing wastes) to 5% Cu (recycled mixed-metal scrap). The high-grade manufacturing wastes require only reclamation, melting, casting, and marketing, which costs about $0.2/kg of copper. Low-grade scrap, on the other hand, requires reclamation, sorting, smelting, refining, and marketing, which costs about $0.6 per kg of copper. Intermediate grade scrap treatment lies between these two extremes.

For scrap recovery to be profitable, the difference between refined copper sales price and scrap purchase price must exceed these treatment charges. When this is not so, scrap is held off the market. In 2011, many smelters are actively seeking scrap and scrap collection is very profitable.

An integrated copper smelter can accept a variety of copper scrap types and recover various contained metals economically. A large fraction of relatively “pure” copper scrap can be accommodated in copper converters and anode furnaces , while waste electrical and electronic equipment (WEEE) and lower-grade scrap can be processed in a Kaldo or a top-submerged lance furnace . The amount of refined copper originating from secondary copper sources.

Copper scrap that is adequately clean can be directly recovered through remelting without further refining, whereas scrap of lower grade has to be refined in similar processes as primary copper.

Copper scrap is often classified according to its source: (1) direct or “home scrap”, which is the scrap generated at the smelter/refinery and has the highest purity, usually recycled internally at the plant; “new scrap” is generated at downstream metal fabricators, e.g. trimmings, boring and croppings, which also usually is recycled at the smelter/refinery.

Copper is one of the few materials that can be recycled repeatedly without any loss of performance. As well as helping to satusfy the annual demand for copper, recycling conserves valuable natural resources, saves energy and reduces CO2 emissions.

Copper recycling contributes to a progressive move toward a more circular economy. However, the loop cannot be completely closed for two reasons. First, demand will continue to increase due to population growth, product innovation and economic development. Second, in most applications, copper stays in use for decades before being ready to recycle and use again. Consequently, the growing demand

for copper will require a combination of raw materials coming from mines (primary copper), as well as from recycled materials (secondary copper). During the last decade about 32 percent of annual copper use came from recycled sources.

These are broadly classified under H. S. Code 7404.

Table - 7

India's Top 10 Sources of Copper Waste and Scrap (HS Code :7408)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Germany	62.16	6.94	76.69	7.93	53.73	11.11	295.65	19.40
2.	Saudi Arab	125.01	13.96	112.17	11.61	59.21	12.25	168.77	11.07
3.	U S A	140.42	15.68	229.71	23.77	88.40	18.28	156.32	10.26
4.	U K	77.29	8.63	55.97	5.79	32.86	6.80	150.90	9.90
5.	U A E	97.14	10.84	73.26	7.58	35.00	7.24	144.00	9.45
6.	Kuwait	29.53	3.30	36.82	3.81	15.66	3.24	93.65	6.14
7.	Netherland	31.04	3.47	29.04	3.00	17.40	3.60	59.36	3.89
8.	Belgium	6.98	0.78	9.07	0.94	10.11	2.09	36.24	2.38
9.	Australia	25.34	2.83	26.70	2.76	12.77	2.64	33.21	2.18
10.	Canada	11.26	1.26	18.10	1.87	6.80	1.41	25.64	1.68
	Others	289.56	32.33	298.98	30.93	151.54	31.34	360.42	23.65
	Total	895.71	100	966.50	100	483.48	100	1524.16	100

Source: DGCI&S

Note : India's Import including re-import

India is completely dependent on Imports of Copper Waste and Scrap. In 2021India's import increased to US $ 1.52 Billion from US $ 483.48 Million in 2020. Over the period under review, India's Copper Waste and Scrap imports attained its maximum worth value of US $ 1.52 Billion in 2021. In 2021 India imported the highest dollar worth Copper Waste and Scrap from Germany with valued at US $295.65Million. In Second and Third source countries were Saudi Arab and USA, from where India imported around US $ 168.77 Million and US $ 156.32 Million worth of Copper Waste and Scrap respectively. In the same year The top 10 countries shared 76.35% of the Copper Waste and Scrap import to India.

Table - 8

World Top 10 Importer of Copper Waste and Scrap (HS Code : 7408)

Rank	Countries	2017		2018		2019		2020	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	9162.24	39.26	9337.72	36.11	7366.79	30.88	4568.40	22.41
2.	Germany	2732.65	11.71	2944.29	11.39	2774.86	11.63	2592.22	12.71
3.	Rep of Korea	1701.34	7.29	1988.77	7.69	1892.48	7.93	1711.55	8.39
4.	Belgium	1071.77	4.59	1136.37	4.39	1201.25	5.04	1387.88	6.81
5.	Japan	1150.35	4.93	1332.87	5.15	1196.35	5.01	959.44	4.71
6.	**India**	**792.85**	**3.40**	**899.20**	**3.48**	**966.35**	**4.05**	**854.30**	**4.19**
7.	Italy	749.26	3.21	979.54	3.79	820.31	3.44	725.15	3.56
8.	Other Asia nes	653.78	2.80	822.16	3.18	669.97	2.81	613.69	3.01
9.	Poland	326.82	1.40	421.05	1.63	462.12	1.94	591.75	2.90
10.	Malaysia	53.07	0.23	382.67	1.48	601.29	2.52	574.10	2.82
	Others	4945.60	21.19	5616.40	21.72	5904.59	24.75	5810.71	28.50
	Total	23339.72	100	25861.04	100	23856.37	100	20389.19	100

Source :UNComtrade

In 2020 Global import of Copper Waste and Scrap totaled were US $ 20.38 Billion, which was decreased by 14.55% from the year of 2019. Global Copper Waste and Scrap import peaked of US $25.86 Billion in 2018, however, in the year 2019 and 2020, it failed to regain its strength. In value terms, China constitutes the largest market for imported Copper Waste and Scrap worldwide with worth value of US $ 4.56 Billion, making up 22.41% of global imports. The second position in the ranking was occupied by Germany (US $ 2.59B), with the share of 12.71% of global imports. It was followed by the Rep of Korea with the share of 8.39%.In the same year **India** constitutes the 6th largest importer of Copper Waste and Scrap in the world with worth value of US $ 854.30Million, making up 4.19% share of world import.

Carbonates ; Per Carbonates

A carbonate is a salt of carbonic acid (H_2CO_3), characterized by the presence of the carbonate ion, a polyatomic ion with the formula CO^{2-} The word carbonate may also refer to a carbonate ester, an organic compound containing the carbonate group $C(=O)(O–)_2$.

The term is also used as a verb, to describe carbonation: the process of raising the concentrations of carbonate and bicarbonate ions in water to produce carbonated water and other carbonated beverages – either by the addition of carbon dioxide gas under pressure or by dissolving carbonate or bicarbonate salts into the water.

In geology and mineralogy, the term "carbonate" can refer both to carbonate minerals and carbonate rock (which is made of chiefly carbonate minerals), and both are dominated by the carbonate ion,CO^{2-}.

Carbonate minerals are extremely varied and ubiquitous in chemically precipitated sedimentary rock. The most common are calcite or calcium carbonate, $CaCO_3$, the chief constituent of limestone (as well as the main component of mollusc shells and coral skeletons); dolomite, a calcium-magnesium carbonate $CaMg(CO_3)_2$; and siderite, or iron(II) carbonate, $FeCO_3$, an important iron ore. Sodium carbonate ("soda" or "natron") and potassium carbonate ("potash") have been used since antiquity for cleaning and preservation, as well as for the manufacture of glass. Carbonates are widely used in industry, such as in iron smelting, as a raw material for Portland cement and lime manufacture, in the composition of ceramic glazes, and more.

Metal carbonates generally decompose on heating, liberating carbon dioxide from the long term carbon cycle to the short term carbon cycle and leaving behind an oxide of the metal. This process is called calcination, after *calx*, the Latin name of quicklime or calcium oxide, CaO, which is obtained by roasting limestone in a lime kiln.

Most carbonate salts are insoluble in water at standard temperature and pressure, with solubility constants of less than 1×10^{-8}. Exceptions include lithium, sodium, potassium, rubidium, caesium, and ammonium carbonates, as well as many uranium carbonates.

In aqueous solution, carbonate, bicarbonate, carbon dioxide, and carbonic acid exist together in a dynamic equilibrium. In strongly basic conditions, the carbonate ion predominates, while in weakly basic conditions, the bicarbonate ion is prevalent. In more acid conditions, aqueous carbon dioxide, $CO_2(aq)$, is the main form, which, with water, H_2O, is in equilibrium with carbonic acid – the equilibrium lies strongly towards carbon dioxide. Thus sodium carbonate is basic,sodium bicarbonate is weakly basic, while carbon dioxide itself is a weak acid.

Carbonated water is formed by dissolving CO_2 in water under pressure. When the partial pressure of CO_2 is reduced, for example when a can of soda is opened, the equilibrium for each of the forms of carbonate (carbonate, bicarbonate, carbon dioxide, and carbonic acid) shifts until the concentration of CO_2 in the solution is equal to the solubility of CO_2 at that temperature and pressure. In living systems an enzyme, carbonic anhydrase, speeds the interconversion of CO_2 and carbonic acid.

It is generally thought that the presence of carbonates in rock is strong evidence for the presence of liquid water. Recent observations of the planetary nebulaNGC 6302 show evidence for carbonates in space,[9] where aqueous alteration similar to that on Earth is unlikely. Other minerals have been proposed which would fit the observations.

Until recently carbonate deposits have not been found on Mars via remote sensing or in situ missions, even though Martian meteorites contain small amounts. Groundwater may have existed at Gusev[10] and MeridianiPlanum.

These are broadly classified under **H. S. Code 2836**.

Table - 9

India's Top 10 Source Countries of Carbonates ; Per Carbonates (HS Code : 2836)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Malaysia	56.74	13.57	63.16	14.29	22.50	11.54	54.61	14.98
2.	Vietnam	42.40	10.14	43.42	9.83	18.02	9.25	38.14	10.46
3.	Egypt	11.12	2.66	13.04	2.95	8.95	4.59	31.41	8.62
4.	CHINA	41.42	9.91	36.95	8.36	16.03	8.23	30.02	8.24
5.	U S A	35.46	8.48	74.58	16.88	27.72	14.22	27.64	7.58
6.	U A E	0.47	0.11	2.70	0.61	12.01	6.16	24.72	6.78
7.	Bulgaria	26.68	6.38	32.35	7.32	14.95	7.67	24.14	6.62
8.	Kenya	20.38	4.88	19.68	4.45	11.75	6.03	21.34	5.86
9.	Turkey	44.99	10.76	53.19	12.04	15.27	7.83	20.14	5.52
10.	Korea RP	6.01	1.44	10.10	2.29	8.55	4.39	18.33	5.03
	Others	132.42	31.67	92.71	20.98	39.14	20.08	74.03	20.31
	Total	418.11	100	441.89	100	194.89	100	364.52	100

Source: DGCI&S

Note : India's Import including Re-import

India's import of Carbonates ; Per Carbonates in 2021 stood at US $ 364.52 Million and US $ 194.89 Million in 2020, which shows a growth of almost 1.9 times from 2020,In 2021India imported the highest dollar worth of Carbonates ; Per Carbonates from Malaysia with valued at US $ 54.61Million. In Second and Third major source countries were Viet Nam and Egypt, from which India has imported around US $ 38.14 Million and US $ 31.41 Million worth of Carbonates ; Per Carbonates respectively. In the same year The top 10 countries shared 79.69 % of the Carbonate ; Per Carbonate import to India.

Table - 10

World Top 10 Importer of Carbonates; Per Carbonates (HS Code : 2836)

Rank	Countries	2017		2018		2019		2020	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Rep. of Korea	487.03	6.49	729.87	8.33	727.10	8.60	531.75	7.13
2.	China	447.79	5.96	495.79	5.66	354.18	4.19	403.95	5.42
3.	Mexico	326.10	4.34	369.94	4.22	384.35	4.55	361.79	4.85
4.	Brazil	306.66	4.08	353.12	4.03	381.67	4.52	328.01	4.40
5.	Japan	345.42	4.60	496.19	5.66	485.05	5.74	316.00	4.24
6.	USA	282.23	3.76	355.27	4.06	317.75	3.76	313.52	4.21
7.	**India**	**328.63**	**4.38**	**418.48**	**4.78**	**441.66**	**5.23**	**310.71**	**4.17**
8.	Germany	254.84	3.39	300.18	3.43	283.40	3.35	294.07	3.94
9.	Indonesia	280.88	3.74	347.22	3.96	334.34	3.96	260.96	3.50
10.	Netherlands	167.57	2.23	189.43	2.16	232.55	2.75	234.66	3.15
	Others	4280.41	57.01	4705.17	53.71	4508.20	53.35	4099.26	54.99
	Total	7507.56	100	8760.66	100	8450.24	100	7454.68	100

Source :UNComtrade

Carbonates ; Per Carbonates imports stood at US $ 7.45 Billion in 2020. The total import value decreased at -12% from the 2019. Global Carbonate ; Per Carbonates imports reached its maximum level of US $ 8.76 in 2018.. In 2020, Rep. of Korea constitutes the largest importer of Carbonates : Per Carbonates worldwide with worth value of US $ 531.75Million, making up 7.13% of global imports. The second position in the ranking was occupied by China (US $ 403.95M), with the share of 5.42% of global imports. It was followed by the Mexico with the share of 4.85%.In the same year **India** constitutes the 7th largest importer of Carbonates ; Per Carbonates in the world with worth value of US $ 310.71Million, making up 4.17% share of world import