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 **Acyclic Alcohols and their Derivatives & Inner Tube of Rubber** and imports of **Primary Cell and Battery and Oxygen Function Amino Compound** 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-2905 & 4013 for export and 8506 & 2922 for import) and the latest finalized data available on the UN Comtrade Database up to year 2021 and on the DGCI&S Database up to September'2022. So, trends from 2018 to 2021 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 Acyclic Alcohols and their Derivatives & Inner Tube of Rubber and imports of Primary Cell and Battery and Oxygen Function Amino Compound**.** 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 Acyclic Alcohols and their Derivatives with their shares in percentage.**
- **Table 2 : World's top 10 Exporters of Acyclic Alcohols and their Derivatives with their shares in percentage.**
- **Table 3 : World's top 10 Importers of Acyclic Alcohols and their Derivatives with their shares in percentage.**
- **Annex- I : Top 3 sources of Inner Tube of Rubber of World's top 3 Importers.**
- **Table 4 : India's top 10 destination of Inner Tube of Rubber with their shares in percentage.**
- **Table 5 : World's top 10 Exporters of Inner Tube of Rubber with their shares in percentage.**
- **Table 6 : World's top 10 Importers of Mono Carboxylic Fatty Acids with their shares in percentage.**
- **Annex-II : Top 3 sources of Inner Tube of Rubber of World's top 3 Importers.**
- **Table 7 : India's top10 Sources of Primary Cell with their shares in percentage.**
- **Table 8 : World's top 10 Importers of Primary Cell with their shares in percentage.**
- **Table 9 : India's top 10 Sources of Oxygen Function Amino Compounds with their shares in percentage.**
- **Table 10 : World's top 10 Importers of Oxygen Function Amino Compounds with their shares in percentage.**

EXPORT

Acyclic Alcohols and Their Derivatives

An **alcohol** is a type of organic compound that carries at least one hydroxyl (−OH) functional group bound to a saturated carbon atom. The term alcohol originally referred to the primary alcohol ethanol (ethyl alcohol), which is used as a drug and is the main alcohol present in alcoholic drinks. An important class of alcohols, of which methanol and ethanol are the simplest examples, includes all compounds which conform to the general formula $C_nH_{2n+1}OH$. Simple monoalcohols that are the subject of this article include primary (RCH_2OH), secondary (R_2CHOH) and tertiary (R_3COH) alcohols.

The suffix -ol appears in the IUPAC chemical name of all substances where the hydroxyl group is the functional group with the highest priority. When a higher priority group is present in the compound, the prefix hydroxy- is used in its IUPAC name. The suffix -ol in non-IUPAC names (such as paracetamol or cholesterol) also typically indicates that the substance is an alcohol. However, some compounds that contain hydroxyl functional groups have trivial names which do not include the suffix -ol or the prefix hydroxy-, e.g. the sugars glucose and sucrose.

The inflammable nature of the exhalations of wine was already known to ancient natural philosophers such as Aristotle (384–322 BCE), Theophrastus (c. 371–287 BCE), and Pliny the Elder (23/24–79 CE). However, this did not immediately lead to the isolation of alcohol, even despite the development of more advanced distillation techniques in second- and third-century Roman Egypt. An important recognition, first found in one of the writings attributed to Jābir ibn Ḥayyān (ninth century CE), was that by adding salt to boiling wine, which increases the wine's relative volatility, the flammability of the resulting vapors may be enhanced.

An alcohol is often called with the name of the corresponding alkyl group followed by the word "alcohol", e.g., methyl alcohol, ethyl alcohol. Propyl alcohol may be *n*-propyl alcohol or isopropyl alcohol, depending on whether the hydroxyl group is bonded to the end or middle carbon on the straight propane chain. As described under systematic naming, if another group on the molecule takes priority, the alcohol moiety is often indicated using the "hydroxy-" prefix.

In archaic nomenclature, alcohols can be named as derivatives of methanol using "-carbinol" as the ending. For instance, $(CH_3)_3COH$ can be named trimethylcarbinol.

Alcohols are then classified into primary, secondary, and tertiary, based upon the number of carbon atoms connected to the carbon atom that bears the hydroxyl functional group. The primary alcohols have general formulas RCH_2OH. The simplest primary alcohol is methanol (CH_3OH), for which R=H, and the next is ethanol, for which $R=CH_3$, the methyl group. Secondary alcohols are those of the form RR'CHOH, the simplest of which is 2-propanol ($R=R'=CH_3$). For the tertiary alcohols the general form is RR'R"COH. The simplest example is tert-butanol (2-methylpropan-2-ol), for which each of R, R', and R" is CH_3. In these shorthands, R, R', and R" represent substituents, alkyl or other attached, generally organic groups.

Simple alcohols are found widely in nature. Ethanol is the most prominent because it is the product of fermentation, a major energy-producing pathway. Other simple alcohols, chiefly fusel alcohols, are formed in only trace amounts. More complex alcohols however are pervasive, as manifested in sugars, some amino acids, and fatty acids.

Alcohols have a long history of myriad uses. For simple mono-alcohols, which is the focus on this article, the following are most important industrial alcohols: methanol, mainly for the production of formaldehyde and as a fuel additive

- ethanol, mainly for alcoholic beverages, fuel additive, solvent
- 1-propanol, 1-butanol, and isobutyl alcohol for use as a solvent and precursor to solvents
- C6–C11 alcohols used for plasticizers, e.g. in polyvinylchloride
- fatty alcohol (C12–C18), precursors to detergents

Methanol is the most common industrial alcohol, with about 12 million tons/y produced in 1980. The combined capacity of the other alcohols is about the same, distributed roughly equally.[2]

These are broadly classified under **H.S. Code-2905.**

Table - 1

India's Top 10 destination of Acyclic Alcohols and Their Derivatives (H.S Code-2905)

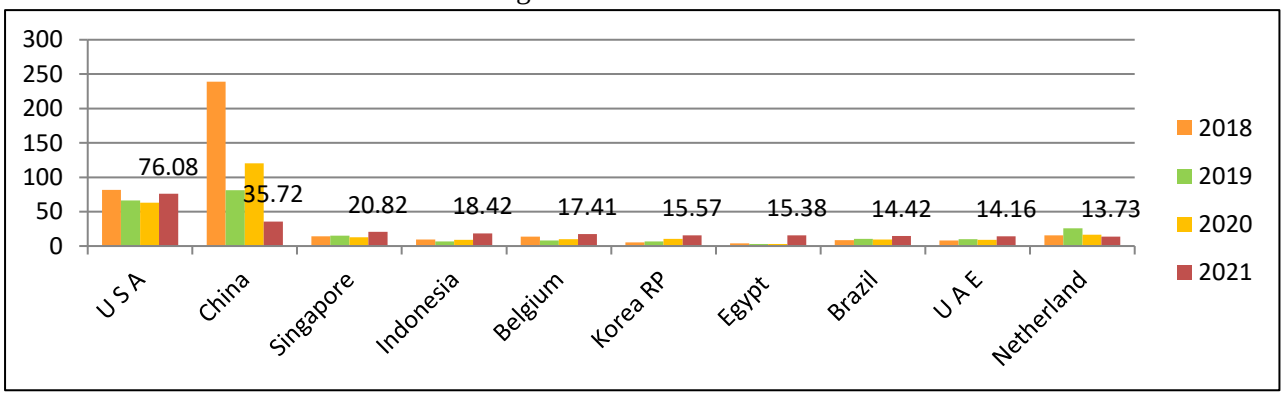
Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	U S A	81.75	14.03	66.32	16.30	63.20	15.32	76.08	18.00
2.	China	239.20	41.06	81.29	19.97	120.19	29.14	35.72	8.45
3.	Singapore	14.26	2.45	15.12	3.71	12.83	3.11	20.82	4.93
4.	Indonesia	9.51	1.63	6.79	1.67	8.93	2.16	18.42	4.36
5.	Belgium	13.81	2.37	8.10	1.99	10.11	2.45	17.41	4.12
6.	Korea RP	5.24	0.90	6.91	1.70	10.28	2.49	15.57	3.68
7.	Egypt	3.85	0.66	3.20	0.79	2.98	0.72	15.38	3.64
8.	Brazil	8.78	1.51	10.62	2.61	9.39	2.28	14.42	3.41
9.	U A E	8.18	1.40	9.92	2.44	8.93	2.16	14.16	3.35
10.	Netherland	15.67	2.69	25.81	6.34	16.64	4.03	13.73	3.25
	Others	182.36	31.30	172.87	42.48	148.98	36.12	180.93	42.81
	Total	582.62	100	406.94	100	412.45	100	422.66	100

Source: DGCI&S.

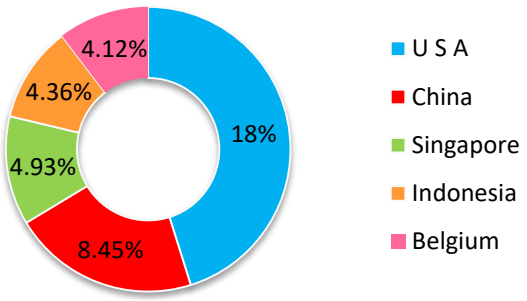
Note : India's Export including re-export

Leading importers of Alcohol and their Derivatives from India from 2018-2021**(Values in million $)**

Data label given on the basis of 2021



India's top 5 destinations of Alcohol and their Derivatives by percentage India in 2021:



In India has exported Acyclic Alcohol of US $ 422.66 million which was US $ 10.21 million more than the year 2020. The figures show the great potential for India's export of Acyclic Alcohol to increase its share in global market. USA is the largest market for Acyclic Alcohol export from India. In 2021, USA imported US $ 76.08 million worth of Acyclic Alcohol from India, which was accounted 18 % of India's total export of Acyclic Alcohol. It was followed by China (8.45%) and Singapore (4.93%). The top 5 countries account for 40% of the total Acyclic Alcohol export from India in that year.

Table-2

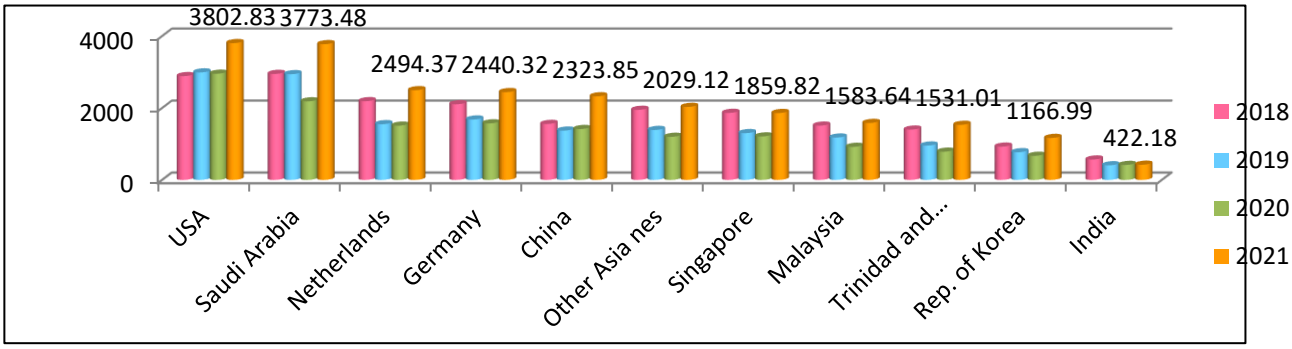
World's Top 10 exporter of Acyclic Alcohols and Their Derivatives (H.S Code-2905)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	USA	2884.86	9.04	2987.83	12.13	2951.85	13.66	3802.83	11.45
2.	Saudi Arabia	2946.10	9.24	2938.42	11.93	2183.69	10.11	3773.48	11.36
3.	Netherlands	2187.95	6.86	1548.47	6.29	1508.02	6.98	2494.37	7.51
4.	Germany	2103.35	6.59	1678.80	6.82	1571.58	7.28	2440.32	7.35
5.	China	1556.13	4.88	1369.86	5.56	1414.75	6.55	2323.85	7.00
6.	Other Asia nes	1947.81	6.11	1388.03	5.64	1197.61	5.54	2029.12	6.11
7.	Singapore	1863.68	5.84	1300.48	5.28	1208.52	5.59	1859.82	5.60
8.	Malaysia	1508.98	4.73	1177.68	4.78	919.19	4.26	1583.64	4.77
9.	Trinidad and Tobago	1398.68	4.38	955.32	3.88	784.70	3.63	1531.01	4.61
10.	Rep. of Korea	924.91	2.90	770.16	3.13	669.62	3.10	1166.99	3.51
18.	**India**	**566.88**	**1.78**	**406.18**	**1.65**	**416.06**	**1.93**	**422.18**	**1.27**
	Others	12010.93	37.65	8102.18	32.90	6776.78	31.37	9792.09	29.48
	Total	31900.25	100	24623.41	100	21602.38	100	33219.71	100

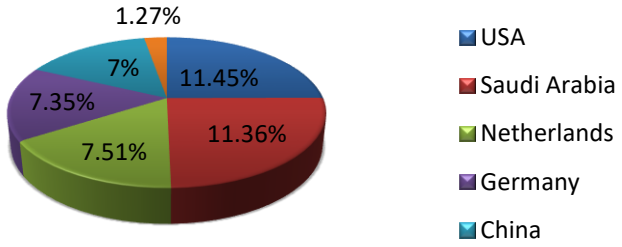
Source: UN Comtrade

Leading Exporters of Alcohol and their Derivatives of world from 2018 to 2021 **(Values in million $)**

Data label given on the basis of 2021



Country wise world's leading exporter of Alcohol and their Derivatives by percentage in 2021 :



The total worth value of Acyclic Alcohol export around the world in year 2021 was US $ 33.21 Billion. Between 2020 and 2021 the exports of Acyclic Alcohol increased by 54%, from 2020. USA was the largest exporter of Acyclic Alcohol in the world in 2021. In that year USA exported US $ 3.80 Billion worth value of these commodities, which was accounted 11.45% of world export, which was followed by Saudi Arabia and Netherlands with share of 11.36 % and 7.51% of world export of Acyclic Alcohol respectively. In that year India stood at 18th position in world export with 1.27% share.

Table-3

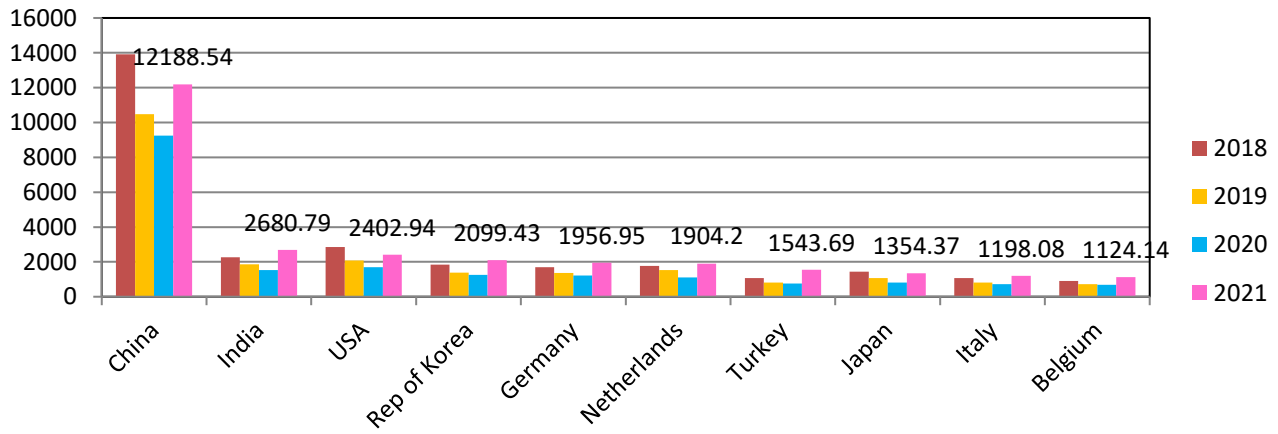
World's top 10 Importers of Acyclic Alcohols and Their Derivatives (H.S Code-2905)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	13916.88	32.15	10469.78	31.08	9251.82	31.45	12188.54	28.13
2.	**India**	**2264.30**	**5.23**	**1866.80**	**5.54**	**1522.39**	**5.17**	**2680.79**	**6.19**
3.	USA	2849.86	6.58	2083.67	6.19	1700.51	5.78	2402.94	5.55
4.	Rep of Korea	1843.34	4.26	1387.26	4.12	1252.35	4.26	2099.43	4.85
5.	Germany	1688.89	3.90	1359.51	4.04	1217.77	4.14	1956.95	4.52
6.	Netherlands	1773.17	4.10	1522.68	4.52	1106.32	3.76	1904.20	4.39
7.	Turkey	1073.92	2.48	813.33	2.41	764.53	2.60	1543.69	3.56
8.	Japan	1447.19	3.34	1063.94	3.16	816.30	2.77	1354.37	3.13
9.	Italy	1077.54	2.49	816.85	2.43	720.10	2.45	1198.08	2.77
10.	Belgium	913.74	2.11	722.68	2.15	692.18	2.35	1124.14	2.59
	Others	14444.45	33.36	11575.20	34.37	10376.56	35.27	14873.61	34.33
	Total	43293.29	100	33681.70	100	29420.82	100	43326.74	100

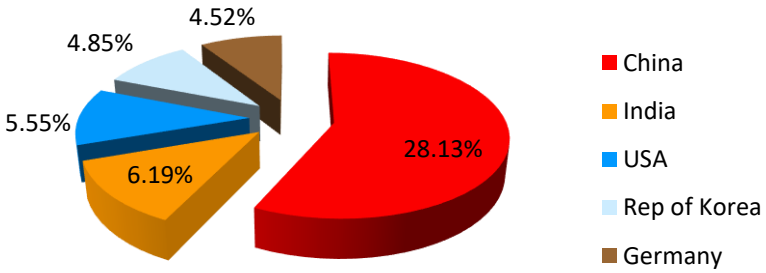
Source : UN Comtrade

Leading Alcohol and their Derivatives importers of world from 2018 to 2021 **(Values in million $)**

Data label given on the basis of 2021



Country wise world's leading importers of Alcohol and their Derivatives by percentage in 2021

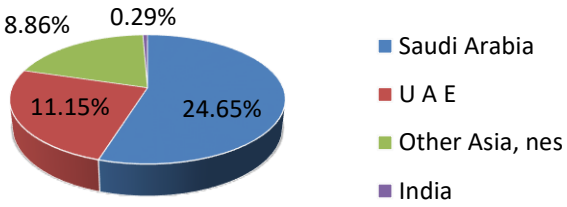


The total value of world import of Acyclic Alcohol importers was US $ 43.32 Billion in 2021. In that year the top importing countries were China (US $ 12.18 B), **India** (US $ 2.68 B), USA **(** US $ 2.40 B**)**, Rp. of Korea (US $ 2.09B) and Germany (US $ 1.95 B). In the same year the top five importing countries together imported nearly 49% share of world import of Acyclic Alcohol importers.

Annexure-1

Sources of world's top 3 importers of Acyclic Alcohols and Their Derivatives (H.S Code-2905)

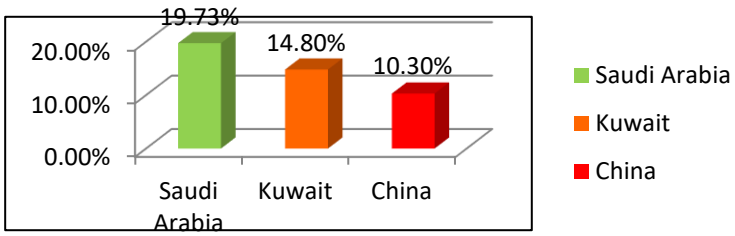
i) Top 3 Sources of Alcohol and their Derivatives to China in 2021 by percentage*:*



China imported most of its Acyclic Alcohol from Saudi Arabia, 24.65% share of China's total import value of it came from Saudi Arabia in 2021 followed by UAE (11.15%) and Other Asia, nes (8.86%). India' contribution was only 0.29% to China.

(Source : UN Comtrade).

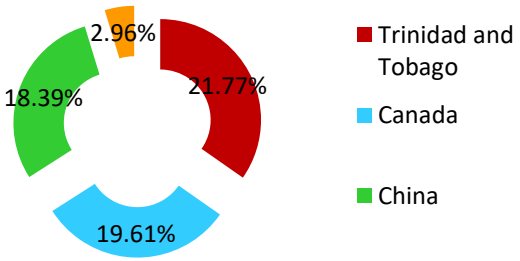
ii) Top 3 Sources of Acyclic Alcohol to India in 2021 by percentage*:*



Saudi Arabia was the primary source of Acyclic Alcohol l to India. India imported 19.73% of Acyclic Alcohol of Jute from India in 2021, followed by Kuwait (14.80%) & China (10.30%).

(Source : UN Comtrade)

iii) Top 3 Sources of Acyclic Alcohol and their Derivatives to USA in 2021 by percentage*:*



USA's 3 major source countries of Acyclic Alcohol in 2021 were Trinidad and Tobago (21.77%), Canada (19.61%) and China (18.39%) in 202. In the same year **India** has exported 2.96% of Acyclic Alcohol to USA **(Source: UN Comtrade)**

Inner Tube of Rubber

An **inner tube** is an inflatable ring that forms the interior of some pneumatic tires. The tube is inflated with a valve stem, and fits inside of the casing of the tire. The inflated inner tube provides structural support and suspension, while the outer tire provides grip and protects the more fragile tube. They are widely used in bicycles and are also used in many motorcycles and heavy road vehicles such as trucks and buses. They are now less common in other wheeled vehicles because of the benefits of having no tube, such as the ability to operate at low pressure and at high pressure (unlike a tube tire, which would pinch at low pressure and burst at high pressure), without going flat. Large inner rings also make effective flotation devices and are widely used in the leisure activity of tubing.

The tube is made out of a mix of natural and synthetic rubber. Natural rubber is less prone to punctures and is often more pliable, while synthetic rubber is cheaper. Often racing bikes will have a higher percentage of natural rubber than regular bikes.

Inner tubes will wear out over time. This makes them thinner, and more likely to burst. According to Dunlop, inner tubes should be changed every 6 months. Inner tubes also tend to be slower than tubeless tires because of the friction between the casing and the inner tube. Tires that use tubes are on average lighter, as the tube can be made relatively thin. As the tubing is sown to the tire, if punctured, the tire can still be ridden flat. They are reportedly more comfortable to use, if attached to the bicycle properly.

The most common use of inner tubes is for repairing a tire. A tire can be punctured by a sharp object and the air pressure will leak out, which will cause the tire to go flat. The inner tube can be inserted into the tire in order to patch it up.

Most present day inner tube compositions lack the superior heat aging properties needed to produce a reliable, improved air impermeable tire inner tube capable of performing in severe service applications such as high speed, bumpy roads and overloading situations, which all may cause rapid deformation

Inner tubes comprising butyl rubber are superior in barrier properties to inner tubes formed from any other rubber. However, certain applications require improved heat resistance which is normally obtained by blending Ethylene- Propylene (EP) or EPDM rubber with butyl in inner tube compounds However, blending of EP or EPDM rubbers increases the air permeability of the rubbers

Tire inner tubes are generally defined as inflatable air containers or bladders that are usually positioned between a tire carcass and a tire rim or wheel. Tire inner tubes can be employed in a variety of tires, such as bicycle tires, automobile, and truck tires. Although most automobile and truck tires in the industrialized world are tubeless, many developing nations, such as India, China, Indonesia, and African nations still use tires with inner tubes. In these developing nations, high temperatures, bad roads and extreme conditions of use cause repeated expansion and contraction of the tire inner tubes. As a result, inner tubes made from these polymers have a limited useful life.

These are broadly classified under **H.S. Code-4013.**

Table - 4

India's Top 10 destination of Inner Tube of Rubber (HS Code –4013)

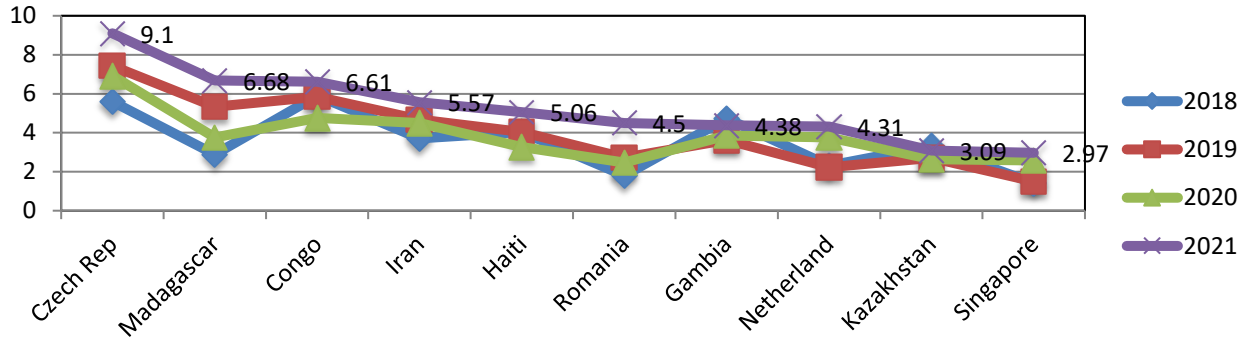
Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	Czech Rep	5.60	7.88	7.43	8.92	6.92	9.69	9.10	8.74
2.	Madagascar	2.89	4.07	5.34	6.41	3.76	5.27	6.68	6.41
3.	Congo	5.90	8.31	5.84	7.01	4.76	6.68	6.61	6.34
4.	Iran	3.71	5.23	4.67	5.62	4.49	6.28	5.57	5.35
5.	Haiti	4.03	5.67	4.04	4.86	3.27	4.58	5.06	4.85
6.	Romania	1.80	2.53	2.72	3.27	2.47	3.45	4.50	4.32
7.	Gambia	4.73	6.66	3.63	4.36	3.85	5.39	4.38	4.20
8.	Netherland	2.32	3.26	2.23	2.68	3.76	5.27	4.31	4.13
9.	Kazakhstan	3.32	4.67	2.71	3.26	2.64	3.70	3.09	2.96
10.	Singapore	1.42	2.00	1.50	1.80	2.57	3.60	2.97	2.85
	Others	35.33	49.72	43.10	51.80	32.90	46.08	51.94	49.84
	Total	71.06	100	83.22	100	71.38	100	104.21	100

Source: DGCI&S

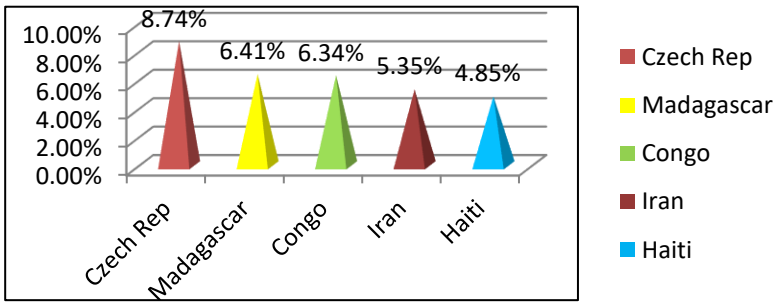
Note : India's Export including re-export

India's major destination Inner Tube of Rubber from 2018-2021**(Values in million USD)**

Data label given on the basis of 2021



India's top 5 major destinations of Inner Tube of Rubber by percentage India in 2021:



The data provided on the export analysis shows that there are so many countries, which actively import Inner Tube of Rubber from India. The combined value of total export is US $ 104.21 Million in 2021 which was increased by more than 46% compare to the year 2020. In the same year India's Inner Tube of Rubber export Value to Czech Rep was US $ 9.10 Million, which holds the top position with the share of 8.74 % of the total export value of India. With 6.41% share Madagascar took runner up position in the global importers of Inner Tube of Rubber from India and Congo was the 2nd runner up with 6.34 % share of India's total export in 2021.

Table - 5

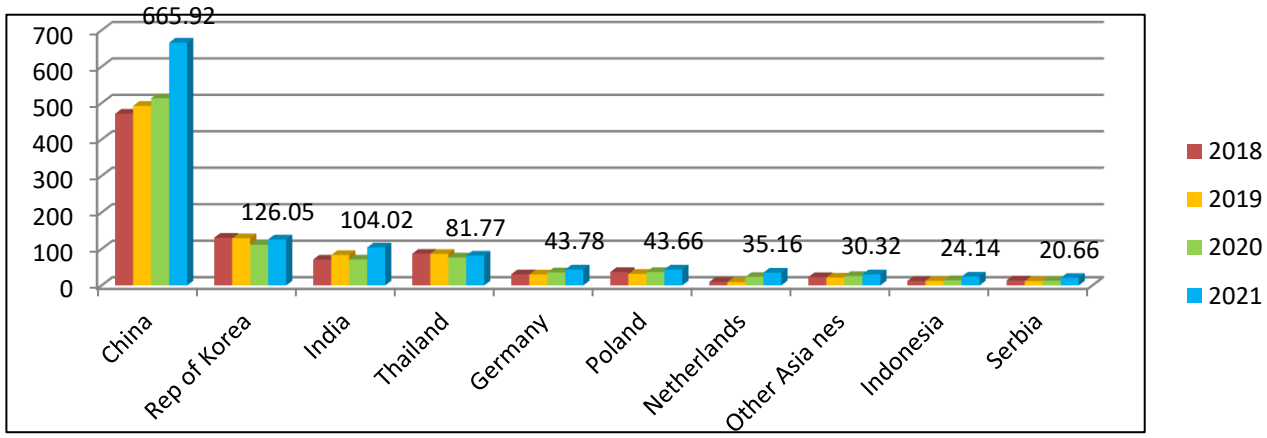
World's Top 10 exporters of Inner Tube of Rubber (HS Code –4013)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	470.63	41.97	492.23	43.06	513.19	44.58	665.92	49.22
2.	Rep of Korea	130.73	11.66	129.16	11.30	111.46	9.68	126.05	9.32
3.	**India**	**70.79**	**6.31**	**83.21**	**7.28**	**71.12**	**6.18**	**104.02**	**7.69**
4.	Thailand	86.78	7.74	86.42	7.56	76.61	6.65	81.77	6.04
5.	Germany	30.47	2.72	29.98	2.62	35.60	3.09	43.78	3.24
6.	Poland	36.85	3.29	31.67	2.77	36.74	3.19	43.66	3.23
7.	Netherlands	9.77	0.87	9.23	0.81	23.32	2.03	35.16	2.60
8.	Other Asia nes	22.89	2.04	21.59	1.89	25.72	2.23	30.32	2.24
9.	Indonesia	12.36	1.10	12.39	1.08	14.12	1.23	24.14	1.78
10.	Serbia	13.67	1.22	11.76	1.03	12.83	1.11	20.66	1.53
	Others	236.31	21.08	235.50	20.60	230.42	20.02	177.55	13.12
	Total	1121.26	100	1143.13	100	1151.13	100	1353.04	100

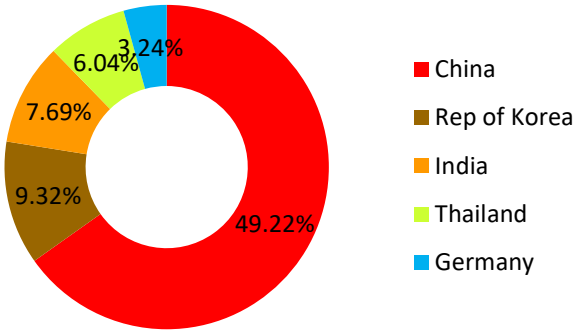
Source: UN Comtrade

Leading Inner Tube of Rubber exporters of world from 2018 to 2021 **(Values in million USD)**

Data label given on the basis of 2021



Export trends in world's leading Inner Tube of Rubber exporters by percentage in 2021:



In value terms, exports of Inner Tube of Rubber amounted to US $ 1.35 Billion in 2021, grew by more than 17.54% over the last year. China was the main global supplier of Inner Tube of Rubber with a worth value of US $ 665.92 Million which was accounted by almost 49.22% share of global exports in that year. It was followed by Rep. Korea (9.32%) and India (7.69%).

Table - 6

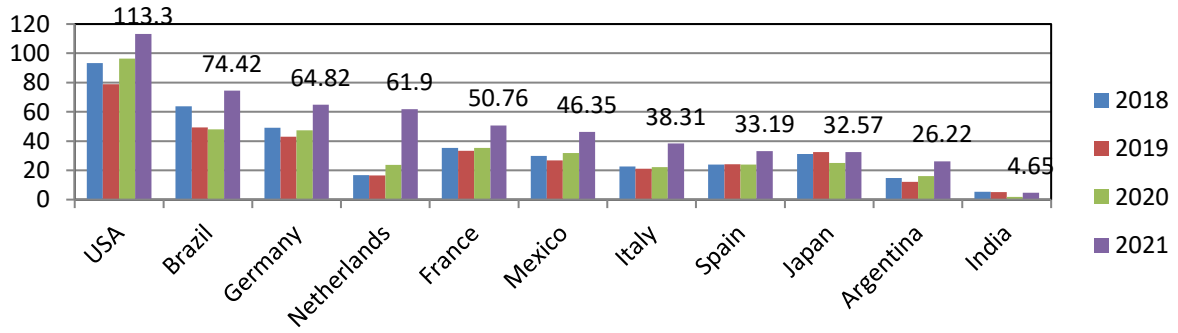
World's Top 10 Importers of Inner Tube of Rubber (HS Code –4013)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	USA	93.40	10.19	78.88	9.30	96.40	11.56	113.30	10.28
2.	Brazil	63.76	6.95	49.30	5.81	48.01	5.76	74.42	6.75
3.	Germany	49.03	5.35	43.01	5.07	47.27	5.67	64.82	5.88
4.	Netherlands	16.70	1.82	16.45	1.94	23.82	2.86	61.90	5.62
5.	France	35.34	3.85	33.46	3.94	35.29	4.23	50.76	4.61
6.	Mexico	29.97	3.27	26.86	3.17	31.95	3.83	46.35	4.21
7.	Italy	22.63	2.47	21.08	2.48	22.23	2.67	38.31	3.48
8.	Spain	24.03	2.62	24.25	2.86	24.06	2.89	33.19	3.01
9.	Japan	31.26	3.41	32.54	3.84	24.98	3.00	32.57	2.95
10.	Argentina	14.86	1.62	12.22	1.44	16.08	1.93	26.22	2.38
53.	**India**	**5.47**	**0.60**	**5.20**	**0.61**	**1.86**	**0.22**	**4.65**	**0.42**
	Others	530.51	57.86	505.16	59.54	461.59	55.38	555.61	50.41
	Total	916.96	100	848.41	100	833.54	100	1102.12	100

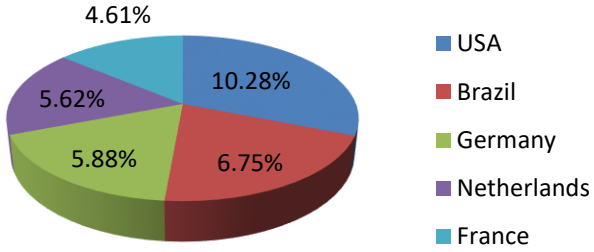
Source :UNComtrade

Major Inner Tube of Rubber of world from 2018 to 2021 **(Values in million USD)**

Data label given on the basis of 2021



Country wise world's top Importer of Inner Tube of Rubber import by percentage in 2021 :

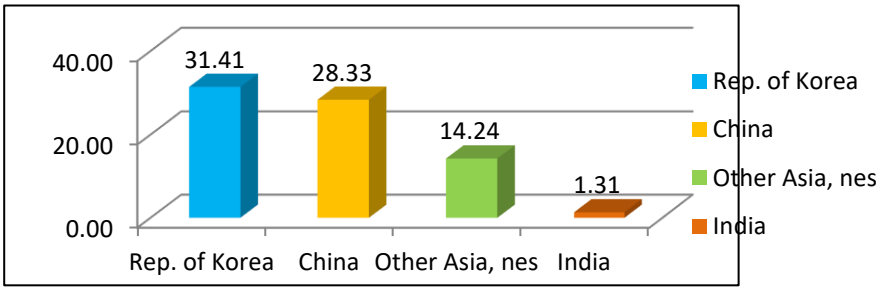


The volume of global imports of Inner Tube of Rubber totaled US $ 1.10 Billion in 2021. The USA remains the Largest Global Importer of Inner Tube of Rubber, comprising 10.28% of global imports in 2021. It was followed by Brazil (6.75%) and Germany (5.88%). In that year **India** imported only 0.42% share of global import of Inner Tube of Rubber and stood at 53rd rank in the world.

Annexure-II

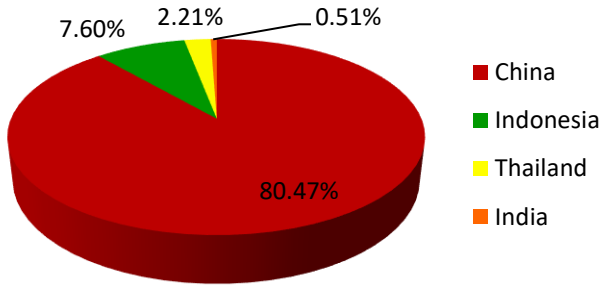
Sources of world's top three importers of Inner Tube of Rubber (HS Code –4013)

i) Top 3 Sources of Inner Tube of Rubber to USA in 2021 by percentage**:**



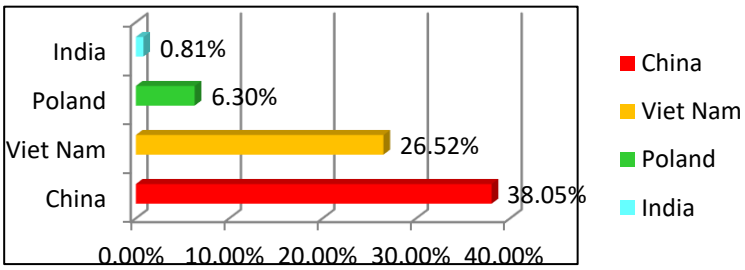
USA's most of its Inner Tube of Rubber came from Rep. of Korea with 31.41% share of its import of the commodity in 20212021. It was followed by China and Other Asia,nes were found to be the 2nd and 3rd largest exporters of Inner Tube of Rubber to USA by 28.33% and 14.24 % shares of USA's total import respectively in 2021. In the same **India** has exported 1.31% share of USA's total impor. **(Source: UN Comtrade)**

ii) Top 3 Sources Inner Tube of Rubber to Brazil in 2021 by percentage**:**



China control the Market of Inner Tube of Rubber to Brazil. In the 2021more than 80% share of Brazil's total import of Inner Tube of Rubber came from China. It was distantly followed by Indonesia (7.60%) and Thiland (2.21%). In that year Brazil imports of Inner Tube of Rubber only 0.50% from **India**. **(Source: UN Comtrade)**

iii) Top 3 Sources of Inner Tube of Rubber to Germany in 2021 by percentage**:**



With 38.05% share of Germany's total import of Inner Tube of Rubber, China became the largest source of it to Germany in 2021. Viet Nam (26.52%) and Poland (6.30%) were other major sources of Inner Tube of Rubber to Germany in that year. India's share was only 0.80% of Germany's total import in 2021. **(Source : UN Comtrade)**

IMPORT

Primary Cell and Battery

A **primary cell** is a battery that is designed to be used once and discarded, and not recharged with electricity and reused like a secondary cell (rechargeable battery). In general, the electrochemical reaction occurring in the cell is not reversible, rendering the cell unrechargeable. As a primary cell is used, chemical reactions in the battery use up the chemicals that generate the power; when they are gone, the battery stops producing electricity. In contrast, in a secondary cell, the reaction can be reversed by running a current into the cell with a battery charger to recharge it, regenerating the chemical reactants. Primary cells are made in a range of standard sizes to power small household appliances such as flashlights and portable radios.

Primary batteries make up about 90% of the $50 billion battery market, but secondary batteries have been gaining market share. About 15 billion primary batteries are thrown away worldwide every year, virtually all ending up in landfills. Due to the toxic heavy metals and strong acids and alkalis they contain, batteries are hazardous waste. Most municipalities classify them as such and require separate disposal. The energy needed to manufacture a battery is about 50 times greater than the energy it contains. Due to their high pollutant content compared to their small energy content, the primary battery is considered a wasteful, environmentally unfriendly technology. Due mainly to increasing sales of wireless devices and cordless tools which cannot be economically powered by primary batteries and come with integral rechargeable batteries, the secondary battery industry has high growth and has slowly been replacing the primary battery in high end products. .

The remaining market experienced increased competition from private- or no-label versions. The market share of the two leading US manufacturers, Energizer and Duracell, declined to 37% in 2012. Along with Rayovac, these three are trying to move consumers from zinc–carbon to more expensive, longer-lasting alkaline batteries.

Western battery manufacturers shifted production offshore and no longer make zinc-carbon batteries in the United States. China became the largest battery market, with demand projected to climb faster than anywhere else, and has also shifted to alkaline cells. In other developing countries disposable batteries must compete with cheap wind-up, wind-powered and rechargeable devices that have proliferated.

The battery terminal (electrode) that develops a positive voltage polarity (the carbon electrode in a dry cell) is called the cathode and the electrode with a negative polarity (zinc in a dry cell) is called the anode. This is the *reverse* of the terminology used in an electrolytic cell or thermionic vacuum tube. The reason is that the terms anode and cathode are defined by the direction of electric current, not by their voltage. The anode is the terminal through which conventional current (positive charge) enters the cell from the external circuit, while the cathode is the terminal through which conventional current leaves the cell and flows into the external circuit. Since a battery is a power source which provides the voltage which forces the current through the external circuit, the voltage on the cathode must be higher than the voltage on the anode, creating an electric field directed from cathode to anode, to force the positive charge out of the cathode through the resistance of the external circuit.

Inside the cell the anode is the electrode where chemical oxidation occurs, as it donates electrons which flow out of it into the external circuit. The cathode is the electrode where chemical reduction occurs, as it accepts electrons from the circuit.

Outside the cell, different terminology is used. As the anode donates positive charge to the electrolyte it becomes negatively charged and is therefore connected to the terminal marked "−" on the outside of the cell. The cathode, meanwhile, donates negative charge to the electrolyte, so it becomes positively charged and is therefore connected to the terminal marked "+" on the outside of the cell.

These are broadly classified under **H. S. Code 8506**.

Table - 7

India's Top 10 Sources of Primary Cell and Battery (H.S. Code - 8506)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	573.74	56.72	277.74	42.69	279.58	47.54	305.55	46.83
2.	Hong Kong	126.01	12.46	127.97	19.67	108.86	18.51	100.87	15.46
3.	Singapore	56.53	5.59	47.81	7.35	38.21	6.50	39.22	6.01
4.	Germany	26.61	2.63	25.78	3.96	20.19	3.43	25.19	3.86
5.	Japan	30.00	2.97	19.40	2.98	15.57	2.65	24.83	3.81
6.	U S A	22.04	2.18	29.67	4.56	23.21	3.95	24.34	3.73
7.	Korea RP	31.53	3.12	16.26	2.50	23.89	4.06	23.18	3.55
8.	France	4.75	0.47	5.40	0.83	10.07	1.71	21.46	3.29
9.	Vietnam	29.83	2.95	5.25	0.81	2.27	0.39	19.89	3.05
10.	Indonesia	35.50	3.51	19.34	2.97	16.06	2.73	17.37	2.66
	Others	74.92	7.41	75.93	11.67	50.17	8.53	50.50	7.74
	Total	1011.46	100	650.56	100	588.10	100	652.40	100

Source: DGCI&S

Note : India's Import including re-import

The dollar value of Primary Cell import in 2021 stood at US $ 652.40 Million and US $ 1.01 Billion in 2018, which shows a decline trends. In the 2021 the import of Primary Cell in India grew by more than 11% compare to the year 2020. In 2021 India imported Primary Cell maximum worth value of US $ 305.55 Million from China or 46.83% of India's total import, which was greater than the previous year Primary Cell shipments from China into India. In second and third place were Hong Kong and Singapore, from where India imported around 15.46% and 6% share of Primary Cell. The top 10 countries shared 92.26% of the Primary Cell import to India in 2021.

Table - 8

World's Top 10 Importer of Primary Cell and Battery (H.S. Code - 8506)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	USA	1057.57	12.16	926.04	11.07	1012.78	11.90	1064.71	11.66
2.	Germany	585.46	6.73	569.35	6.81	566.11	6.65	652.84	7.15
3.	Hong Kong	640.92	7.37	557.15	6.66	514.47	6.04	502.15	5.50
4.	Malaysia	388.30	4.46	410.92	4.91	485.40	5.70	483.00	5.29
5.	China	414.17	4.76	420.25	5.03	406.27	4.77	472.25	5.17
6.	Singapore	359.49	4.13	334.07	4.00	324.97	3.82	370.39	4.06
7.	U K	389.05	4.47	421.39	5.04	342.92	4.03	337.56	3.70
8.	Viet Nam	143.23	1.65	185.52	2.22	294.50	3.46	315.42	3.45
9.	Netherlands	207.13	2.38	183.88	2.20	225.44	2.65	314.78	3.45
10.	France	262.93	3.02	257.44	3.08	249.54	2.93	309.50	3.39
35.	**India**	**99.78**	**1.15**	**65.03**	**0.78**	**58.86**	**0.69**	**65.15**	**0.71**
	Others	4151.02	47.72	4030.65	48.20	4032.72	47.37	4245.85	46.49
	Total	8699.07	100	8361.66	100	8513.97	100	9133.62	100

Source :UNComtrade

In 2021, the global Primary Cell imports amounted to US $ 9.13 Billion, increasing by more than 7.28% against the previous year figure. Over the period under review, global refined lead imports reached its maximum level of US $ 9.13 Billion in this year, however, from 2018 to 2020, it was on almost flat level. In 2021 USA (US $ 1.06 B) constitutes the largest market for imported Primary Cell worldwide, making up 11.66 % of global imports. The second position in the ranking was occupied by Germany (US $ 652.84 M), with the share of 7.15% of global imports. It was followed by the Hong Kong, with the share of 5.50%. India's position in world import of Primary Cell was 35th with share of 0.71 of world import in the same year.

Oxyzen Function Amino Compound

Among the most important classes of organic compounds that contain oxygen are (where "R" is an organic group): alcohol (R-OH); ethers (R-O-R); ketones (R-CO-R); aldehydes (R-CO-H); carboxylic acids (R-COOH); esters (R-COO-R); acid anhydrides (R-CO-O-CO-R); amides (R-C(O)-NR_2). There are many important organic solvents that contain oxygen, among which: acetone, methanol, ethanol, isopropanol, furan, THF, diethyl ether, dioxane, ethylacetate, DMF, DMSO, acetic acid, formic acid. Acetone ($(CH_3)_2CO$) and phenol (C_6H_5OH) are used as feeder materials in the synthesis of many different substances. Other important organic compounds that contain oxygen are: glycerol, formaldehyde, glutaraldehyde, citric acid, acetic anhydride, acetamide, etc. Epoxides are ethers in which the oxygen atom is part of a ring of three atoms.

Oxygen reacts spontaneously with many organic compounds at or below room temperature in a process called autoxidation. Alkaline solutions of pyrogallol, benzene-1,2,3-triol absorb oxygen from the air, and are used in the determination of the atmospheric concentration of oxygen. Most of the organic compounds that contain oxygen are not made by direct action of oxygen. Organic compounds important in industry and commerce are made by direct oxidation of a precursor include:

The element is found in almost all biomolecules that are important to, or generated by, life. Only a few common complex biomolecules, such as squalene and the carotenes, contain no oxygen. Of the organic compounds with biological relevance, carbohydrates contain the largest proportion by mass of oxygen (about 50%). All fats, fatty acids, amino acids, and proteins contain oxygen (due to the presence of carbonyl groups in these acids and their ester residues). Furthermore, seven of the amino acids which are incorporated into proteins, have oxygen incorporated into their side-chains, as well. Oxygen also occurs in phosphate (PO_4^{3-}) groups in the biologically important energy-carrying molecules ATP and ADP, in the backbone and the purines (except adenine) and pyrimidines of RNA and DNA, and in bones as calcium phosphate and hydroxylapatite.

This includes alcohols, phenols, ethers, aldehydes, ketones, carboxylic acids, and esters. Figure 9.1 provides the basic organic functional groups for these compounds and the IUPAC suffix that is used to name these compounds. While you will not have to formally name complete structures, you should be able to identify functional groups contained within compounds based on their IUPAC names. For example, an alcohol is an organic compound with a hydroxyl (-OH) functional group on an aliphatic carbon atom. Because -OH is the functional group of all alcohols, we often represent alcohols by the general formula ROH, where R is an alkyl group. The IUPAC nomenclature guidelines use the suffix ‘-ol’ to denote simple compounds that contain alcohols.

These are broadly classified under the ITCHS Code-2922.

Table 9

India's Top 10 Sources of Oxygen Function amino Compound (HS Code- 2922)

Rank	Countries	2018		2019		2020		2021	
		Value (million $)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	China	532.05	70.67	538.11	70.67	556.53	71.58	709.42	68.49
2.	Korea RP	15.37	2.04	20.03	2.63	26.00	3.34	44.69	4.31
3.	Italy	16.19	2.15	21.31	2.80	26.44	3.40	32.00	3.09
4.	Germany	31.67	4.21	26.98	3.54	26.17	3.37	30.75	2.97
5.	Thailand	23.43	3.11	17.42	2.29	5.08	0.65	27.16	2.62
6.	U S A	25.80	3.43	23.68	3.11	21.17	2.72	25.86	2.50
7.	Cambodia	0.00	0.00	0.00	0.00	0.00	0.00	20.88	2.02
8.	Indonesia	25.23	3.35	19.97	2.62	9.87	1.27	20.59	1.99
9.	U A E	9.02	1.20	9.42	1.24	13.35	1.72	17.97	1.73
10.	Norway	2.74	0.36	11.71	1.54	15.74	2.02	17.11	1.65
	Others	71.36	9.48	72.82	9.56	77.18	9.93	89.32	8.62
	Total	752.87	100	761.46	100	777.53	100	1035.74	100

Source: DGCI&S

Note : India's Import including re-import

China, Korea RP and Italy are the top three countries from which India imported Oxygen function amino Compound with import value shares of 68.49%, 4.31 % and 3.09 % respectively in 2021. Thus India's Oxygen function amino Compound imports of value nearly 76 % shares of India's import of the commodity were sourced from these three countries in 2021. India's import of the commodity was increase up to 33.21 % in the year 2021.

Table 10

World's top 10 Importers of Oxygen Function amino Compound (HS Code- 2922)

Rank	Countries	2018		2019		2020		2021	
		Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)	Value (million$)	Share (%)
1.	USA	2836.17	14.20	1883.75	11.44	1237.50	8.59	1899.55	11.18
2.	Germany	3010.91	15.08	2409.74	14.63	1657.45	11.50	1704.27	10.03
3.	Belgium	2778.25	13.91	2021.06	12.27	1142.25	7.93	1288.52	7.58
4.	**India**	**753.19**	**3.77**	**761.41**	**4.62**	**780.41**	**5.42**	**1036.71**	**6.10**
5.	Japan	1171.18	5.87	770.71	4.68	1127.77	7.83	786.98	4.63
6.	Netherlands	502.02	2.51	505.25	3.07	536.76	3.73	713.00	4.20
7.	Italy	546.27	2.74	521.79	3.17	512.98	3.56	642.81	3.78
8.	China	501.08	2.51	450.33	2.73	500.27	3.47	562.16	3.31
9.	Spain	426.90	2.14	391.27	2.38	427.26	2.97	514.82	3.03
10.	France	422.07	2.11	405.78	2.46	441.36	3.06	499.92	2.94
	Others	7018.34	35.15	6344.91	38.53	6043.54	41.95	7342.73	43.21
	Total	19966.38	100	16465.99	100	14407.53	100	16991.48	100

Source: UN Comtrade

USA tops the world in terms import of Oxygen Function Amino Compound and its share in the world export of it was more than 11% of the total world import value of Oxygen function amino Compound in 2021, followed by Germany and Belgium with share of 10% and 7.58% of world import. In the year 2021 **India** imports US $ 1.0. Billion and comes at 4th rank in the world. The trends of world import of Oxygen function amino Compound is increasing from 2018 to 2020 however in the year 2021 it has increased by nearly 17.94 % compare to that in the year 2020.