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AN OVERVIEW OF CHEMICAL AND PETROCHEMICAL INDUSTRY IN INDIA – A STUDY

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ABSTRACT:

The chemical industry is a knowledge intensive as well as capital intensive industry. It is an integral constituent of the growing Indian Industry. It includes basic chemicals and its products, petrochemicals, fertilizers, pesticides, paints, varnishes, gases, soaps, perfumes and toiletry and pharmaceuticals. The diversification within the chemical industry is large and covers more than eighty thousand commercial products. This Industry occupies a pivotal position in meeting basic needs and improving quality of life. The industry is the main stay of industrial and agricultural development of the country and provides building blocks for several downstream industries, such as textiles, papers, paints, varnishes, soaps, detergents, pharmaceuticals, etc.

KEYWORDS: *chemical industry , growing Indian Industry , thousand commercial products.*

INTRODUCTION :

As per National Industrial Classification (NIC) 2008, Chemical & Chemical products are covered under the industry division 20. The description of product groups at 4 digit level under this division is given below:

Table 1 : Description of Product Groups

Class	Description
2011	Manufacture of basic chemicals
2012	Manufacture of fertilizers and nitrogen compounds
2013	Manufacture of plastics and synthetic rubber in primary forms
2021	Manufacture of pesticides and other agrochemical products
2022	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
2023	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
2029	Manufacture of other chemical products n.e.c.
2030	Manufacture of man-made fibres

The industry division 24 of NIC 2004 is equivalent of industry division 20 (manufacture of chemical & chemical products), 21(manufacture of pharmaceuticals, medicinal chemicals and botanical products) and 268 (manufacture of magnetic and optical media) of NIC 2008.

According to National Accounts Statistics 2017, brought out by the Central Statistics Office (CSO), chemical and chemical products sector (industry division 20 and 21 of NIC 2008) accounted for 2.39 per cent of the GVA (at 2011-12 prices) in 2015-16, compared to 2.23 per cent in 2014-15. The share of this sector in the GVA of manufacturing sector at 2011-12 prices was 13.38 per cent during 2015-16 as compared to 12.82 per cent in 2014-15. The average Indices of Industrial Production for (IIP) for the Chemicals and Chemicals product (Industry Division 20:NIC 2008) the year 2016-17 stands at 116.5, which is 2.46 per cent higher as compared to previous year. The size of the Indian Chemical industry (industry division 20 and 21 of NIC 2008) in terms of value of output in

the year 2015-16 was Rs. 922,908 crore.

The production of Selected Major Chemicals and Petrochemicals during the years 2013-14 to 2017-18 (up to September 2017) is given in Table-2. The production of Major Chemicals and Petrochemicals in 2017-18 (up to September 2017) was 12814 thousand MT, compared to 12906 thousand MT in 2016-17 (up to September 2016) implying negative growth of 0.71 per cent.

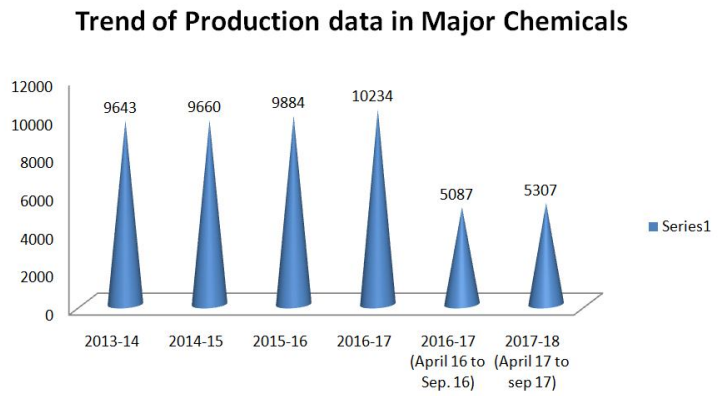
Table 2 : Production of selected major chemicals and petrochemicals

						Figures in 000'MT	
Group	**Production / Growth Rate**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2016-17 (April 16 to Sep. 16)**	**2017-18 (April 17 to sep 17)**
Alkali Chemicals	Production	6481	6625	6802	7009	3494	3682
	Growth Rate (%)	-0.09	2.22	2.67	3.04		5.37
Inorganic Chemicals	Production	906	944	1002	1053	530	520
	Growth Rate (%)	1.70	4.18	6.08	5.13		-1.89
Organic Chemicals	Production	1792	1619	1589	1638	790	821
	Growth Rate (%)	6.28	-9.67	-1.87	3.12		3.93
Pesticides (Technical)	Production	179	186	188	214	108	110
	Growth Rate (%)	15.41	3.95	0.57	13.97		1.86
Dyes & Pigments	Production	284	285	304	320	165	174
	Growth Rate (%)	18.40	0.58	6.60	5.28		5.62
Total Major chemicals	Production	9643	9660	9884	10234	5087	5307
	Growth Rate (%)	1.94	0.18	2.32	3.54		4.32
Synthetic Fibers	Production	3144	3527	3554	3595	1809	1808
	Growth Rate (%)	0.63	12.18	0.75	1.16		-0.06
Polymers	Production	7876	7558	8839	9163	4626	4349
	Growth Rate (%)	4.88	-4.04	16.95	3.67		-5.98
Elastomers (S. Rubber)	Production	105	172	242	285	138	135
	Growth Rate (%)	8.67	64.13	40.76	17.91		-2.35
Synth. Detergent intermediates	Production	597	596	566	664	352	364
	Growth Rate (%)	-4.82	-0.11	-5.09	17.36		3.32
Performance Plastics	Production	1685	1591	1700	1799	894	854
	Growth Rate (%)	-0.37	-5.54	6.86	5.82		-4.48
Total Basic Major Petrochemicals	Production	13406	13443	14900	15506	7819	7506
	Growth Rate (%)	2.75	0.28	10.83	4.07		-3.96
Total Major Chemicals and basic petrochemicals	Production	23048	23103	24783	25739	12906	12816
	Growth Rate (%)	2.41	0.24	7.27	3.86		-0.7

Note: Production is aggregated based on Monthly Production Returns from manufactures under large and medium scale.

CHEMICAL SECTOR - PRODUCTION TRENDS

It may be seen from Table 2 that the production of Alkali Chemicals accounts for around 69 per cent of the total production of Major Chemicals. The production of Major Chemicals in 2017-18 (up to September 2017) was 5307 thousand MT, compared to 5087 thousand MT during the same period in 2016-17 (up to September 2016) implying a growth of 4.32 per cent. The trend in the production of selected major chemicals is depicted in Chart 1.

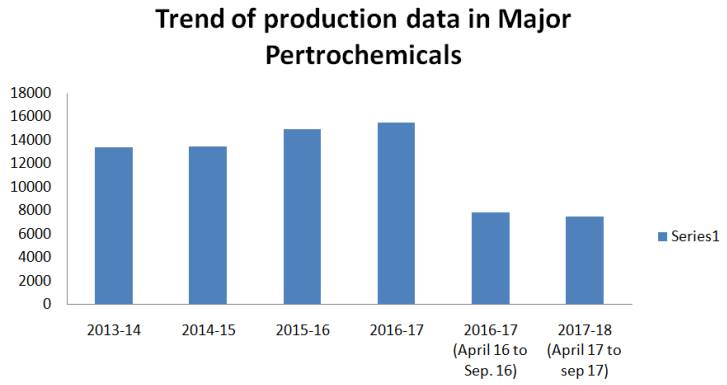


PETROCHEMICALS SECTOR- PRODUCTION TRENDS

Petrochemicals, which comprise of plastic and host of other chemicals, are downstream hydrocarbons derived from crude oil and natural gas. The value additions in the petrochemicals chain offer immense possibilities and cater to the need of textiles and clothing, agriculture, packaging, infrastructure, healthcare, furniture, automobiles, information technology, power, electronics and telecommunication, irrigation, drinking water, construction and a host of other articles of daily and specialized usage amidst other emerging areas.

There are four naphtha and four gas based cracker complexes in the country with a combined annual ethylene capacity of 4.23 million MT. There are six aromatic complexes with a combined Xylene capacity of 4.45 million MT. There is combined propylene capacity of 4.7 million MT.

From Table 2, It may be seen that the production of polymers account for around 59 per cent of the total production of Basic Major Petrochemicals. The production of Basic Major Petrochemicals in 2017-18 (up to September 2017) was7509



thousand MT, compared to 7819 thousand MT in 2016-17 (up to September 2016) implying negative growth of 3.96 per cent. The trend in the production of selected major petrochemicals has been depicted in Chart 2.

INDEX OF INDUSTRIAL PRODUCTION

The weight of chemical and chemical products (Industry Division 20 of NIC 2008) is 7.87 out of 100 in the Index of Industrial Production (Base Year: 2011-12). The General Index for the month of September 2017 stands at 122.7, which is 3.8 per cent higher as compared to the level in the month of September 2016. The cumulative growth for the period April-September 2017-18 over the corresponding period of the previous year stands at 2.5 per cent. The Index of Industrial Production for the Manufacturing sector for the month of September 2017 stands at 12501, which is 3.39 pre cent higher as compared to the level in the month of September 2016 whereas the Index of Industrial Production for the Chemicals and Chemical products for the month of September 2017 stands at 118.5 which is 1.37 per cent higher as compared to the level in the month of September 2016. The cumulative growth in manufacturing sector during April September 2017-18 over the corresponding period of 2016-17 has

been 1.9 per cent. The month wise Index of Industrial Production during 2016-17 and 2017-18 (up to September 2017) is depicted in Table 3.

Table 3 Index of Industrial Production

(Base : 2011-12= 100)

Period	Chemicals and Chemical Products	Manufacturing	General
Weight	7.87	77.63	100.00
Apr -16	109.6	114.0	113.7
May -16	119.8	122.4	121.3
Jun-16	117.4	121.1	119.7
Jul -16	119.1	119.4	116.8
Aug-16	119.5	119.6	116.5
Sep-16	116.9	121.0	118.2
Oct-16	117.1	121.3	120.3
Nov-16	111.1	115.7	115.9
Dec-16	112.8	121.4	121.7
Jan-17	116.2	123.1	123.1
Feb-17	114.2	119.7	119.2
Mar-17	124.7	132.7	133.2
Apr-17	108.5	117.3	117.3
May-17	113.6	125.6	124.8
Jun-17	110.2	120.3	119.3
Jul-17	111.5	119.1	117.9
Aug-17	117.1	123.7	121.7
Sep-17	118.5	125.1	122.7

Source: website of Ministry of Statistics and Programme Implementation.

The behaviour of IIP of chemicals and chemical products vis-à-vis General IIP and IIP in respect of manufacturing from 2012-13 to 2016-17 is depicted in Table 4.

Table 4: Annual Average (April - March) Indices of Industrial Production (Base: 2011-12=100)

Particulars	Weight	2012-13	2013-14	2014-15	2015-16	2016-17
Chemicls & Chemical Products	7.87	103.9	108.8	109.2	113.7	116.5
Manufacturing	77.63	104.8	108.6	112.7	115.9	121.0
General	100.00	103.3	106.7	111.0	114.7	120.0

Source: website of Ministry of Statistics and Programme Implementation.

Whole Sale Price Index (WPI)

The annual rate of inflation based on monthly WPI (Base Year: 2011-12) released by the Office of the Economic Advisor, for 'all commodities' stood at 2.60 per cent for the month of September 2017 over September 2016. The index for 'Food Articles' group rose by 2.04 per cent for Manufactured Products' by 2.72 per cent and for 'Chemicals & Chemical products by 0.91 per cent during the same period. The weight for Chemicals of Chemical products in the WPI is 6.47 out of all commodities weight of 100. The month-wise Index of WPI from April 2016 to September 2017 is given in Table 5.

Table 5: Whole Sale Price Index
(Base Year: 2011-12=100)

Month	All commodities	Food Articles	Manufactured Products	Chemicals & Chemical products
Weight	100.00	15.26	64.23	6.47
Apr -16	109.0	137.8	109.2	111.5
May -16	110.4	140.9	109.8	111.7
Jun-16	111.7	144.0	110.0	111.3
Jul -16	111.8	144.5	110.3	111.7
Aug-16	111.2	142.6	110.2	110.7
Sep-16	111.4	141.9	110.4	110.3
Oct-16	111.5	141.9	110.8	110.3
Nov-16	111.9	142.0	111.0	110.5
Dec-16	111.7	137.6	111.1	110.2
Jan-17	112.6	136.5	111.6	110.7
Feb-17	113.0	136.6	111.8	111.3
Mar-17	113.2	137.6	112.3	111.7
Apr-17	113.2	138.6	112.6	111.6
May-17	112.9	137.9	112.6	111.7
Jun-17	112.9	139.2	112.6	111.5
Jul-17	113.9	147.9	112.6	111.1
Aug-17	114.8	150.9	112.8	111.1
Sep-17	114.3	144.8	113.4	111.3

Source: Office of the Economic Advisor, Ministry of Commerce & Industry, Data accessed on 12.12.2017 from http://www.eaindustry.nic.in

Table 6 below show the WPI for chemicals & Chemical products vis-à-vis all commodities, food articles and manufactured products during the years 2012-13 to 2016-17

Table 6 Annual Average (April - March) Indices of Wholesale Price
(Base Year: 2011-12=100)

Description	Weight	2012-13	2013-14	2014-15	2015-16	2016-17
All commodities	100	106.9	112.5	113.9	109.7	111.6
Food Articles	15.26	110.9	124.5	131.5	134.9	140.3
Manufactured Products	64.23	105.3	108.5	111.2	109.2	110.7
Chemicals & Chemical Products	6.47	108.3	113.3	116.1	112.6	111

Source: Office of the Economic Advisor, Ministry of Commerce & Industry, Data accessed on 12.12.2017 from http://www.eaindustry.nic.in

Table 7 shows WPI of different commodity groups within Chemicals & Chemical products group during the years 2012-13 to 2016-17

Table 7 WPI of Chemicals & Chemical Products
(Base year: 2011-12=100)

Description	Weight	2012-13	2013-14	2014-15	2015-16	2016-17
Chemicals and Chemical Products	6.47	108.30	113.30	116.10	112.60	111.00
Basic Chemical	1.43	107.20	112.10	114.10	105.80	104.7
Fertilizers and Nitrogen Compounds	1.48	113.50	116.50	118.90	121.40	118.7
Plastic and Synthetic rubber in primary form	1.00	108.90	118.50	124.40	115.30	113.7
Pesticides and Other Agrochemical Products	0.45	107.50	111.10	120.70	122.60	116.8
Paints, Varnishes and Similar Coatings, Printing Ink and Mastics	0.49	105.50	109.70	111.90	109.80	108.5
Soap and Detergents, Cleaning and Polishing Preparations, Perfumes and Toilet Preparations	0.61	106.80	111.50	112.40	112.30	113.7
Other Chemical Products	0.69	104.80	110.70	111.80	108.40	106.5
Man-Made Fibres	0.30	102.30	105.60	100.90	93.30	94.1

Source: Office of the Economic Advisor, Ministry of Commerce & Industry, Data accessed on 12th December 2017 from http://www.eaindustry.nic.in

International Trade

Trends in exports and imports of Chemicals and Chemical Products (excluding Pharmaceutical Products and Fertilizers) during 2013-14 to 2017-18 (up to September 2017) are given in Table 8 and Chart 3 and Chart 4

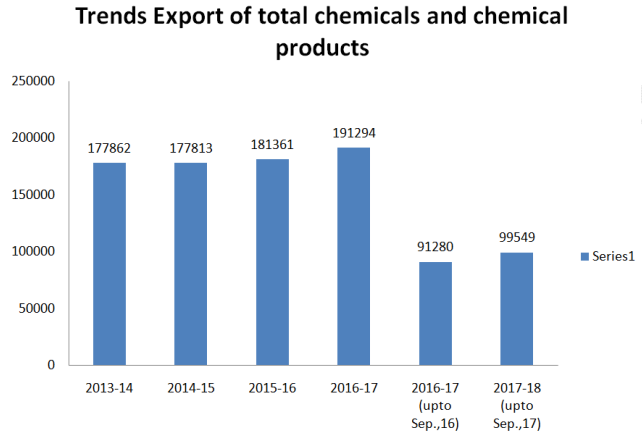
Table 8: Exports and Imports - Chemicals and Chemical Products
(excluding Pharmaceutical Products and Fertilizers)

A. Exports **(Rs. in crore)**

HS Code	Commodity	2013-14	2014-15	2015-16	2016-17	2016-17 (upto Sep.,16)	2017-18 (upto Sep.,17)
	Total National Exports	**1905011**	**1896445**	**1716378**	**1852340**	**883371**	**937701**
28	Inorganic Chemicals	8258	8749	7913	9518	4047	4843
29	Organic Chemicals	72860	73069	75325	78717	37425	41951
32	Tanning or Dyeing	15455	17206	16165	17250	8679	9071
38	Miscellaneous Chemical	18694	19432	20083	21876	9897	10996

	Products						
39	Plastic and Articles thereof.	34154	31022	34339	35642	17412	18557
4002	Synthetic Rubber and Factice	245	379	452	483	195	239
54	Man-Made Filaments	15575	14621	13460	13379	6727	7001
55	Man-Made Staple Fibers	12621	13334	13625	14429	6897	6891
A:Total Chemicals and Chemicals Products		**177862**	**177813**	**181361**	**191294**	**91280**	**99549**
% share in total export		9.3	9.4	10.6	10.3	10.3	10.6

Sources: Directorate General of Commercial Intelligence and Statistics (DGCIS) Portal accessed Data accessed on 14th December 2017.

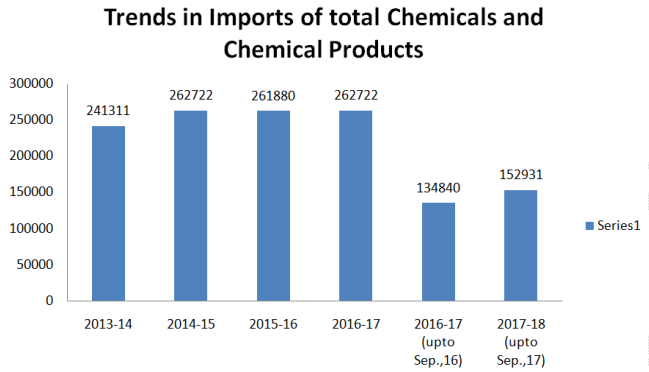


B. Imports **(Rs. in crore)**

HS Code	Commodity	2013-14	2014-15	2015-16	2016-17	2016-17 (upto Sep.,16)	2017-18 (upto Sep.,17)
	Total National Imports of which	2715434	2737087	2490298	2577422	1173665	1419495
28	Inorganic Chemicals	29063	31413	33170	31413	16725	17923
29	Organic Chemicals	103157	108320	101986	108320	50580	57588
32	Tanning or Dyeing	9254	9821	10467	9821	5322	6639
38	Miscellaneous Chemical Products	23107	25494	27207	25494	15438	17715
39	Plastic and Articles thereof.	61072	71398	74566	71398	39494	44776
4002	Synthetic Rubber and Factice	7339	6697	5205	6697	2915	3352
54	Man-Made Filaments	4597	5042	4879	5042	2470	2747

55	Man-Made Staple Fibers	3722	4539	4401	4539	1896	2191
B:Total Chemicals and Chemicals Products		**241311**	**262722**	**261880**	**262722**	**134840**	**152931**
% share in total import		8.9	9.6	10.5	10.2	11.5	10.8

Sources: Directorate General of Commercial Intelligence and Statistics (DGCIS) Portal accessed Data accessed on 14th December 2017.



The Import of Chemicals and Petrochemical products (excluding Pharmaceutical Products and Fertilizers) contributed 10.8 per cent of total imports in 2017-18 (Up to September 2017) compared to 11.5 per cent in 2016-17 (Up to September 2016) whereas the Export contributed 10.6 per cent of total Export in 2017-18 (Up to September 2017), conopared to 10.3 per cent in 2016-17 (Up to September 2016).

CONCLUSION

Chemical and petro chemical companies from the foundation of the manufacturing industry and are affiliated with the most important sectors across the globe. The play a central role when it comes to the sustainable development of our society. Without chemistry there would be no solutions for the major challenges of our time.

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