

CHEM: 602-Industrial Chemistry

CHEM – 602 Industrial Chemistry (Cr.03)

Chemical processes i.e. unit operations, unit process, Chemical process control and instrumentation, Safety; Hazards such as fire or toxic materials. Research and development, Important modern industries, their chemistry and technology, like pharmaceutical, polymer, paper, petroleum, oil, fats and waxes, water conditioning, flavors and food additives, sugar and starch, steel, soap and detergent etc.

Recommended Books

Kent, J.A. Riegel's Handbook of Industrial Chemistry, CBS Publishers and Distributors, New Delhi, (1997).

Smith, R., Chemical Process Design, McGraw Hill Book Co. New York, (1995).

Instructor : Prof. Dr. Ashraf Shaheen

Introduction

Industrial chemistry is the manufacturing art concerned with the transformation of matter into useful materials in useful amounts. Usually this transformation of available materials into more desirable ones involves some kind of process following a recipe.

At the time of independence, Pakistan has inherited only 34 industrial units out of 921 industrial units in subcontinent. They were cotton textile, cigarettes, sugar, rice husking, cotton ginning and flour milling industries; and together they contributed only 7% of GDP and employed a little over 26,000 employees.

Historical Prospects

Industrial development or history of industries in Pakistan can be divided into 5 phases:

Phase 1 (1947-1957):

1. This phase started from 1947 ended to 1958. During this period, the country was newly born and politically immature. During this 11-years period, 8 prime ministers came into power. Not a single prime minister was strong enough to pursue the industrial policy well.
2. During this period, the policy emphasis was on import substitution.
3. Government had established a committee to formulate industrial policy.
4. This committee emphasized on manufacturing industries, reduction of imports, and net social and economic advantages to the country.
5. ***Pakistan Industrial Finance Corporation (PIFC)*** and ***Pakistan Industrial Credit and Investment Corporation (PICIC)*** were established in 1948.
6. To create skilled labour, a ***Swedish-Pak Institute of Technology*** was established in 1955.
7. ***Pakistan Industrial Technical Assistance Centre (PITAC)*** was established in 1956.

Phase 2 (1958-1969):

1. In 1958, a military government of Ayub came into power in Pakistan and announces a new industrial policy in 1959. This phase witnessed the massive industrial growth in the country.
2. This industrial policy emphasis on private sector and the development of agro-based industries.
3. During this period, the government gave emphasis on intermediate and capital goods, i.e., electrical, chemical, machine tools, etc.
4. Various types of funds were established to promote the industrial development in the country.

Phase 3 (1973-1977):

1. During this period, a new democratic government of Bhutto came into power and adopted the principles of mixed economy.
2. Government ruthlessly nationalized 34 industrial units belonging to the following basic units:
 - (a) Vegetable ghee and oil industries (26 industrial units)
 - (b) Shipping industry
 - (c) Iron and steel industries
 - (d) Basic metal industries
 - (e) Heavy engineering industries
 - (f) Assembly and manufacture of motor vehicles
 - (g) Tractor plants
 - (h) Heavy and basic chemicals
 - (i) Petro-chemical industries
 - (j) Cement industries
 - (k) Public utilities including electric generations, gas and oil industries.
3. The nationalized industries were put under the management of **Board of Industrial Management (BIM)**.
4. **Pakistan Industrial Development Corporation (PIDC)** was established.
5. Other reforms were taken by the government were:
 - (a) Labour reforms
 - (b) Abolition of bonus voucher system
 - (c) Reduction of sales tax on imported items
 - (d) Revision of import policy
 - (e) Establishment of industrial units in less developed / rural areas.

Phase 4 (1977-1988):

1. A new martial law government by Zia came into power in 1977. The new military government in 1977 announced the reversal of previous government's nationalization policy and introduced a new industrial policy.
2. The federal government offered for the transfer of shares of nationalized industries to their former owners, under **Economic Reforms Order 1978**, and thus the new open way for denationalization of industries.
3. Government announced tax holidays and revised import policy.
4. To boost private industrial development, following measures were taken:
 - (a) Reduction in interest charges by banks to 12.5% on all fixed investments.
 - (b) Removal of taxes on issuance of bonus shares.
 - (c) Fixing standard rebates of excise duty on additional 17 items.

Phase 5 (1988-2008):

1. During the first half of this phase, i.e., 1988 to 1999 the country had faced worst political conditions in the history of Pakistan.
2. Two governments had come into power for twice, i.e., Benazir's Government and Nawaz's Government, and not even governed for more than three years. Therefore, the industrial policy was never the top priority of those two governments.
3. Nawaz Sharif, however, lightly emphasized on infrastructural development in Pakistan, but interrupted by the bloodless coup d'état by Musharraf in 1999. Although Nawaz had adopted considerable economic policies, i.e., deletion policy, deregulation policy and privatization policy, which were also pursued by succeeding governments. Much of these policies were influenced by IMF.
4. During the second half of this phase (i.e., 2000-2008), industries of Pakistan faced greater influence of cheaper goods imported under WTO agreements.

5. The highlights of industrial policy of this phase are as below:

(a) Deletion Policy: Although this policy was announced during Phase 4 in 1987 but also pursued by the governments in later phase. The objective of deletion policy was to obtain self-reliance in engineering sector.

(b) Deregulation Policy: Almost the whole industrial sector was exempted from the requirement of government sanctions except:

- (i) Arms and ammunitions
- (ii) Security printing, currency and mint
- (iii) High explosives
- (iv) Radioactive substances

(c) Privatization Policy: To reduce the financial burden imposed on government and to reduce slack utilization of resources, privatization policy was adopted and is still continued. The main objectives of privatization were to improve the overall performance of state-owned industries and to promote