

investment capital to build facilities to further process these petrochemicals into intermediates and end products such as plastics, elastomers, agricultural chemicals, surface coatings, textiles, oil additives, drugs, etc.

The desire by refiners to upgrade products and to expand their business in a closely associated field leads them to diversify into petrochemicals. A number of these are produced concurrently with fuel products and only need to be removed from the refinery streams and purified to the desired specifications. Most of the processes involved are closely related to those used in petroleum refining operations and generally, the necessary technical skills are available or can be obtained easily. Location, size of refinery, types of crude oils and other hydrocarbons processed by the refiner are all factors that have an important bearing on a refiner's decision to manufacture petrochemicals.

The force that encourages refiners to consider diversification into petrochemicals is growing in Canada just as it is in other parts of the world, but it should be recognized that because of the small domestic market that prevails in Canada the opportunities are sometimes less numerous.

**Foreign Trade in Petrochemicals.**—No accurate figures are available on the overall imports or exports of most petrochemicals but these materials enter into a significant portion of Canada's foreign trade. On exports, particularly, it seems likely that the products included in over 90 p.c. of the value of Canadian chemical shipments have utilized one or more petrochemicals in the manufacturing process.

Canada's petrochemical industry has not developed, even on a per capita basis, as quickly as that of the United States. This can be traced mainly to the fact that large markets are needed to enable the economies of large-volume operations. The smaller Canadian market frequently will not support the cost of operating a small plant to compete openly with the lower costs of larger U.S. plants. Imports of petrochemicals have therefore been a significant part of the total sales of these chemicals and it is likely that Canada's petrochemical output will continue at a fraction of the comparable U.S. production.

The Canadian industry's position should, however, become more favourable with time as more and more plants are built here to make products that previously have been imported. To do this, it will be necessary to control costs. Despite an abundance of material resources, the relatively small population of the country and the vast area it covers mean small plants or higher transportation costs, or both. Accordingly, it is usually necessary to obtain export business to secure enough volume to build an economic plant.

Introduction of new products and the expanding population have caused a continuing shortage of many chemicals in most countries of the world. This strong demand has enabled Canadian producers to sell in export markets even in competition with countries having lower costs and export demand has been an important factor in sustaining Canada's petrochemical industry. There is every reason to believe that Canadian plants will continue to depend, directly or indirectly, on export markets for many years to come. While competition is growing abroad for the older established petrochemicals, it is likely that export opportunities will continue to be available as various markets experience imbalances of supply and demand and Canadian firms are alert to capitalize on opportunities.

**Outlook in the Field of Petrochemicals.**—One of the most important fields for future growth in petrochemicals will be that of plastics and synthetic resins. By 1965 these materials will likely become the most important single outlet in Canada for petrochemicals, with production probably reaching a 500,000,000-lb. level. Plans have been announced for the production of polypropylene, a relatively new plastic material, and diisocyanates which will displace imports as a raw material for the existing Canadian manufacture of the polyurethane plastics. Other petrochemicals that appear to be in a favourable position to grow include synthetic rubber (with new facilities under construction), synthetic textiles, oil additives and agricultural products.