INTRODUCTION

This chapter explores past and present trends in the world chlor-alkali industry. It reviews historical production, capacity and economic factors leading up to current industry status. Current and future production issues are discussed along with the possibilities of conversions from caustic soda to soda ash. Factors influencing future chlorine demand are explored, and growth forecasts are presented. Lastly, such key technologies as membrane cells and superconductors are discussed with respect to the chlor-alkali industry of the future.

Many analyze world chlor-alkali markets on a country by country or even a region by region basis. While this may be useful in evaluating macro trends, it tends to overlook some significant factors, namely: (1) world trade is a function of chlorine derivative demand, and the associated surpluses or shortages of caustic soda; (2) corporations, rather than countries, are the entities which produce, buy, sell and trade most chlor-alkalis; and (3) multinational companies may operate under a different set of geopolitical goals than the countries in which they operate.

It would be desirable for a country to have steady chlor-alkali production rates, supplemented by imports and exports as needed to balance demand. However, this is not realistically possible in a free economy. Companies are driven by profit motives. They typically attempt to maximize profits, not social wellbeing. To further complicate trade patterns, these profit motives are more often than not based on the maximization of short-term returns.

Thus, as regional economies fluctuate and exchange rates float, world trade patterns will change. These factors partially explain the tremendous volatility in chlor-alkali prices over time, as seen in Fig. 1. This has been quite apparent in the caustic soda markets of the last 2 years. In the summer of 1986 deep sea caustic soda was selling for as little as $35 a tonne fob the US Gulf Coast. By the fall of 1987, the same material, if and when available, was selling for as much as $300 on the same basis. Today, while almost impossible to obtain, spot caustic soda is priced as high as $500 a tonne.
Further complicating world trade patterns are artificial trade barriers which preclude certain products from particular countries. Examples which come to mind in the chlor-alkali industry are Mexican tariffs on caustic soda, and Japanese and European tariffs on natural soda ash. Although the merits of these and other tariffs are well beyond the scope of this chapter, they are pointed out simply to illustrate some of the factors affecting international trade.

While the product price swings are extreme cases, they illustrate the point that regional factors can, and do, have a significant impact on world trade. In all probability world trade in chlor-alkalis, and many other commodity chemicals, will become considerably more competitive in the next few years. Several factors which will continue to affect international trade in chlor-alkalis and derivatives include:

- fluctuations in energy costs and currency translations;
- rationalization of aging capacity;
- capacity creep and expansion;
- capacity additions in developing regions;
- continued growth of multinational corporations;
- impact of China and the East Bloc;
- changing technology.

These and other factors will force chlor-alkali producers to be much more cognizant of world markets than ever before. In order to remain competitive companies will have to effectively manage resources. Undoubtedly, this will entail maximization of profits on a multinational basis. While this will be the only way for companies to survive, it brings with it a new set of concerns. How will the growth of multinationals impact regional markets?

**CAPACITY SHIFTS**

There has been a continuing trend toward the establishment of chlor-alkali capacity in less-developed countries. Much of this development has taken place for nationalistic reasons, although some has occurred to take advantage of lower cost