

was carried out by sequentially separating into the foam first carbonates in an acidic medium, and then phosphate from the chamber product in an alkaline medium. The process of enrichment of *Karatau* carbonate ores using roasting has also been developed.

In 1965, there were five factories in *Karaganda*, *Aktyubinsk*, *Semipalatinsk*, *Ust-Kamenogorsk* and *Chimkent*. The *Karaganda* and *Semipalatinsk* plants for asbestos-cement products and the *Chimkent plant for asbestos-cement constructions* were commissioned.

In the 70th years capacities for production of mineral fertilizers at the *Dzhambulsky superphosphate plant* where new shops on production of sulfonated coal and the defluorinated fodder phosphates took effect considerably increased. Production by their method of melting of natural phosphates and defluorinating in the cyclonic furnace was for the first time developed. The company began to produce ammoniated superphosphate - a fertilizer with better physical and agrochemical properties than simple superphosphate. During these years, *Kazakhstan* produced in the country most of the yellow phosphorus, 40% of chromite salts, 20% of low-pressure polyethylene, over 10% of sulfuric acid. The power industry was successfully developing in the republic. The coal industry has gained significant development. In the *Karaganda* and *Ekibastuz basins*, coal production reached 61 million tons per year, of which 41% was mined in the most progressive, open, way.

One of the leading industries was the steel industry. At the *Sokolov-Sarbai mining and processing plant*, ore enrichment and industrial production of high-quality iron ore pellets were established. The *Karaganda Iron and Steel Combine* became the largest enterprise with a full metallurgical cycle on production of special profiles of a hire, high-quality steel and cast iron. The first stage of the *Ermakovsky plant of ferroalloys* with production of ferrosilicium was started.

All this led to a significant increase in the share of *Kazakhstan* in the all-Union production of ferrous metals. The republic ranked first in the country in the extraction of chromite ores, the third in the production of iron and manganese ores; the role of the republic in the production of steel, rolled products, and ferroalloys increased.

Non-ferrous metallurgy was further developed. *Tishinsky mine and zinc plant* at *Leninogorsk polymetallic plant*, the largest in the country mines of *Dzhezkazgan mining and metallurgical combine* were put into operation; the complex of alumina production of *Pavlodar aluminum plant*, *Ust-Kamenogorsk titanium-magnesium plant* reached initial design capacities. The production capacities of the *Ust-Kamenogorsk Lead-Zinc* and *Balkhash Mining and Metallurgical Combine* were expanded. The oil industry also developed at an accelerated pace.

All this created the necessary basis for the development of chemical technology in *Kazakhstan* and necessitated the training of appropriate engineering and technical personnel.

Schemes of the movement of material and power flows. Periodic, semi-continuous and continuous processes. Essence and methods of drawing up and image of material and power balances. Definition of product yield and coefficient of useful energy application. Determination of power, productivity and intensity of production. The economic requirements imposed to rational production

The economic efficiency of chemical production is one of its most important criteria. It depends on the scientific and technical level and production capacity.

The level of chemical production is determined by a set of *technical and economic indicators (TEI)*: the yield of the target product, the degree of conversion of raw materials, productivity, intensity of the apparatus, expenditure ratios for raw materials and energy, process selectivity, product quality, labor productivity, cost of production.

They depend on a number of factors that characterize the state of production: the age of the enterprise, the technical condition of the equipment, the degree of automation of production, the qualifications of personnel, the level of work organization, the progressiveness of the technologies used, etc.