aluminum. Kazakhstan will be able to effectively manage its oil reserves and take a worthy place in the global oil market.

The most qualitative and competitive raw material base is ferrous metallurgy. The share of active explored reserves of chrome ores in the state balance is 99%, manganese ores - 91%. A significant proportion of active reserves (96%) are characterized by developed iron ore deposits. The raw material base of non-ferrous metallurgy is characterized by significantly lower reserves activity. For lead, it is 69%, for copper - 74%, zinc - 92%.

Almost all active proven reserves of copper are localized in the fields of Central and Eastern Kazakhstan, which are currently being actively exploited. About half of the active reserves of lead and zinc are enclosed in the fields of East Kazakhstan that are being developed or are being prepared for development. The other half of the potentially competitive reserves are concentrated in the Zhairem field in Central Kazakhstan, which is unique in scale and requires significant investment.

The number of active reserves does not include the huge reserves of zinc and lead from the Shalkiya deposit (South Kazakhstan), whose ores are characterized by low quality and require the use of high-performance and efficient mining and processing schemes. In the gold ore industry, the activity of explored reserves is quite high - at the level of current prices, it exceeds 80 years.

The share of active proven reserves of aluminum is 51% (with low quality), tin - 69% (Syrymbet deposit), coal - 45%, uranium - 61% (most deposits suitable for mining by leaching), and titanium - up to 48%, nickel - 34%.

Complex use of raw materials. Secondary raw materials and its processing
The main areas of rational use of chemical raw materials are:
- the use of cheaper raw materials (with minimal costs for extraction);
- the use of secondary material resources (waste, by-products of other industries);
- the use of less concentrated raw materials (poor ores);
- complex processing of raw materials, that is, a method in which all valuable components contained in raw materials are extracted and used to the maximum extent.

Complex use of raw materials allows to approach the solution of the major problem of modern chemical technology – to minimize technological losses of raw materials and to completely use production wastes. It allows to expand a source of raw materials, to increase the volume of the made products, to lower expenses of raw materials and energy and also to substantially reduce environmental pollution by industrial emissions. Complex use of raw materials leads to reduction of capital investments in production, to decrease in product cost and improvement of all technical and economic indicators of production.

Preparation of raw materials for processing
The purpose of the preparation of raw materials is to give it a composition and properties that ensure the optimal course of the chemical process. Preparation of raw materials allows you to increase the concentration of the useful component, to give the desired humidity, determined by the processing conditions, the content of impurities, the desired dispersion, etc.

Methods of preparation of raw materials depend on its state of aggregation. Solid raw materials are prepared by methods of classification, grinding (or, in certain cases, consolidation), dehydration and enrichment.

Classification is the process of separating homogeneous bulk materials into fractions (classes) by the size of their constituent particles. Classification is carried out by sieving materials (screening), separation of the mixture of particles by the rate of their deposition in the liquid phase (hydraulic classification), separation of the mixture of particles by the rate of their deposition in the air using separators (air classification).

Grinding is a mechanical process of dividing a solid body into parts due to the application of external forces. Grinding can be carried out by impact, crushing and abrasion. Grinding of particles