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ENRICHMENT AND QUALITY CONTROL OF ILMENITE-ZIRCON SANDS

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Ilmenite-zircon sands are a critical source of titanium and zirconium. Demand for titanium and zirconium products is steadily growing both in Russia and abroad. The advancement of enrichment technologies and product quality improvement is an issue of current importance.

As primary industrial sources of Ti and Zr, ilmenite-zircon sands undergo a three-phase enrichment circuit:

- raw material pre-treatment,
- spiral gravity concentration,
- final concentrate refinement.

Magnetic and electromagnetic separation, vacuum filtration and thermal drying methods are used. The separation efficiency is ensured by differentials in mineral density, magnetic susceptibility and electrical conductivity.

The quality control system operates at all processing stages – from raw materials to final products. The basic analytical method used is atomic emission spectrometry, which enables precise determination of zirconium content and associated elements. This method is characterized by high accuracy and capability for simultaneous multi-component analysis.

Additionally, mineralogical analysis is performed to identify undesirable impurities, facilitate their removal and enhance zircon concentrate purity.

High-precision analytics ensures production of materials that meet modern requirements for chemical composition and processing characteristics.

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