

Solvent extraction and separation of Te (IV) from hydrochloric acid leaching solution of tellurium ore

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Tellurium, a scattered metal with special physical and chemical properties, is widely applied in the area of metallurgy, electronics, chemicals, glass and ceramics, pharmaceutical and so on. Especially, it is irreplaceable in the new energy and advanced materials, national defense and sophisticated technology, which is considered as an important strategic resource by many countries and governments. In 1991, the world's first independent tellurium ore was found in Dashuigou of Sichuan Province. With the consumption of tellurium increasing year by year and the scarcity of tellurium in the world, it is of great significance to study and develop new technology to use tellurium ore and alleviate the tellurium supply and demand.

Our work focuses on the solvent extraction and separation of Te (IV) and Bi (III) from hydrochloric acid leaching solution of tellurium ore. The Tri-*n*-octylamine (N235) in sulfonated kerosene (1 : 1, V : V) is used for extractant at 298 K. A preliminary study demonstrated that under the conditions of H⁺ 7 mol/L and extraction time 100 s, one-stage extraction rate of tellurium and bismuth were 99.2 % and 0.7 %, respectively. Using distilled water as the stripping agent (1:1, O/A) and stripping time is 3 min, one-stage back-extraction rate of tellurium was 98.1 %. Results show that tellurium and bismuth can be efficiently separated with N235 as extractant and further study is continued.

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