Rhenium oxidation with air oxygen in the hydrometallurgical processing of copper concentrates

To reveal rhenium concentration in products of copper and molybdenum processing, and to develop a technique of rhenium extraction, it is important to know its behavior in various concentration and metallurgical processes. The determination of the effect of pulp bubbling with air makes it possible to obtain information on the behavior of rhenium in flotation and hydrometallurgical processing of the concentrates. For this purpose the authors conducted a series of experiments on leaching-out copper sulfide concentrates without and with air-bubbling of the concentrate. The experimental conditions were a) the BDW method: solid-liquid = 1:3; the composition of the solution: 10 g/l soda, 17 g/l calcium oxide; duration of mechanical stirring: 5 hours; temperature ~95°C; and

b) the IMIO method, proposed by the authors: solid-liquid = 1:5; soda solution 30 g/l; mechanical stirring for 5 hours, at ~95°C. Aged dry, fresh dry and fresh wet concentrate samples were used. It was found that sample no. 1 was not affected by air bubbling. It is extracted by the IMIO method about 25% more than by the BDW method. The effect of air oxygen is high for samples no. 2, dried at 80 - 100°C. Re extraction increases by 40% (BDW) and by 19% (IMIO). The effect on Re-oxidation decreases, to 18% (BDW) and to 3% (IMIO) when sample no. 3 is treated by air bubbling. The experiments show that in all cases the IMIO method yields optimum results. Preliminarily dried concentrates should be leixviated. During lixiviation the pulp should be subjected to intensive air bubbling, in particular when processing dried concentrate. There is 1 table.