

A PROTOTYPE PILOT PLANT FOR GOLD EXTRACTION BY POLYURETHANE FOAM

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This paper presents the first development of a prototype pilot plant for gold-complex extraction from aqueous solution, using polyurethane foam. The project of the prototype was based on experimental laboratory studies of extraction, elution and loading capacity of gold using polyether foam, tested in batch and column experiments. The results revealed that absorption capacity of gold by polyether foam is similar to active carbon. The prototype is constituted of two systems of cells juxtaposed. The down cell works as extraction circuit and the upper cells as elution circuit. A foam belt travels against the pulp current, in a sinusoidal movement, cell to cell, through the extraction and elution circuits. The gold-ions absorption and the transportation of pulp, cell to cell, are performed simultaneously by the foam belt. After the belt reach has travelled through the extraction circuit, it goes to the upper circuit. In this elution circuit, a similar sinusoidal movement takes place in an organic solution for desorption of gold loading in the foam structure. Operation of the foam belt is continuous, sequential and it happens in closed circuit for extraction, elution of the gold and regeneration of the foam. The extraction efficiency, compatible to active carbon, is associated to the low residence time and it suggests that the foam has potential for application in commercial plants.