STUDY ON ATTRITION OF CARBON PARTICLES DURING REGENERATION OF ACTIVATED CARBON

A Kale

Chief Engineer, Mintek, Johannesburg, South Africa 2125. Email: adityak@mintek.co.za

ABSTRACT

Cyanidation technology that utilises a Carbon in Pulp or Carbon in Leach process is the most dominant and efficient commercial technology currently used for extracting gold from ores. Activated carbon used in CIP/ CIL process is subjected to harsh abrading conditions during mixing and agitation in the adsorption tanks, transferring of slurry using centrifugal pumps and carbon regeneration, resulting in the generation of carbon fines that leads to loss of gold value and lower operational efficiencies.

Gold mines typically lose 64 g of activated carbon per ton of ore processed in the form of carbon fines. The two major unit operations responsible for the generation of carbon fines are the adsorption mixing and carbon regeneration operations. Approximately 40% of the 64 g of activated carbon is lost in the carbon regeneration process. This paper will focus mainly on the deterioration of carbon particles during the carbon regeneration process using traditional rotary kiln technology and the alternative Minfurn technology. Minfurn is an electrical vertical kiln that processes carbon through gravity and that doesn't have any tumbling action.

Eluted carbon obtained from a gold mine was regenerated using a Minfurn and the resulting data was compared to the carbon regenerated using a conventional rotary kiln from gold processing plants. Particle size distribution analyses of the carbon samples before regeneration and after regeneration were compared and the shift in particle size was determined.

Regeneration of activated carbon using a Minfurn resulted in less attrition of carbon particles when compared to the carbon particles processed in a rotary kiln.