

Recovery of Gold from Strong Acidic Solution using Sulfur-Impregnated Carbonaceous Bamboo

Ryoto HASHIKAWA* and Takaaki WAJIMA*

*Department of Urban Environment Systems, Graduate School of Science and Engineering,
Chiba University, Chiba 263-8522, Japan
E-mail: r.hashikawa-1017@chiba-u.jp

Gold is used in various fields and is a rare resource in nature. Recovery of gold from domestic wastes is desired in Japan. Bamboo is an abundant biomass resource in Japan, and the promotion of its utilization is desired. In our previous studies, sulfur-impregnated carbonaceous adsorbent with high heavy metal removal has been prepared from biomass resources using sulfur with a high affinity for heavy metals. In this study, sulfur-impregnated carbonaceous bamboo was prepared from bamboo powder by pyrolyzing at 800°C with sulfur under N₂ atmosphere for recovering gold from strong acidic solution. Gold could be recovered from strong acidic solution by precipitation of gold metals on the surface of sulfur-impregnated carbonaceous bamboo, while little amount of gold was recovered using raw bamboo powder and non-sulfur-impregnated carbonaceous bamboo. The adsorption and reduction reaction of gold on the surface of sulfur-impregnated carbonaceous bamboo occurred rapidly, and it was observed that gold particles were larger as the reaction time increased. Gold was precipitated as smaller particles on the surface of sulfur-impregnated carbonaceous bamboo than those on the surface of activated carbon.

Keywords : Gold recovery, Bamboo, Sulfur-impregnated carbonaceous adsorbent, adsorption, reduction