

Amine-functionalized KOH-activated orange peel carbons with enhanced aurocyanide adsorption performance

John Kwame Bediako, 윤영상^{1,†}

전북대학교; ¹전북대학교 반도체화학공학부

(ysyun@jbnu.ac.kr[†])

Activated carbon had been widely applied for gold recovery and still remains the most preferred adsorbent owing to its good physicochemical and adsorption properties. Moreover, KOH is reported to produce activated carbons with high yields, well-defined pore sizes, ultra-high specific surface areas and high reactivities. In this study, therefore, post-synthesis functionalization of KOH-activated orange peel carbon with quaternary ammonium compound was carried out to improve the aurocyanide, $K[Au(CN)_2^-]$ adsorption capacity. The synthesis process commenced with pre-carbonization and activation under inert environment, followed by chemical functionalization. The crystallinity, pore structure, atomic energy binding states and gold loading capacity was investigated via instrumental characterization and adsorption studies. The maximum adsorption capacity was estimated to reach 749.28 ± 34.79 mg/g, according to the Langmuir isotherm model. Finally, the spent activated carbon was regenerated, making it potentially suitable for application in large-scale gold recovery plants.