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SORPTION OF GOLD BY ACTIVATED CARBONS FROM NONCYANIC SOLVENTS

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Activated carbons are carbonaceous materials with well developed porous structure consisting of hydrophobic graphene layer surface and hydrophilic surface functional groups. These characteristics make them useful as adsorbents, catalyst and catalyst support. Activated carbon can be produced from a wide variety of raw materials, basically by two methods as: physical and chemical activation or a combination of both.

In, the use of activated carbons for sorption of gold from thiourea solutions is indicated. It is shown that during sorption gold is not reduced to a metallic state, but owing to activated carbon phase it forms the thiourea complexes. However, detailed studies of the process of sorption of gold from non-cyanide solutions were not carried out. There is practically no data on the process of desorption of reduced gold and the possibility of repeated use of the sorbent.

In this regard, we have investigated the process of sorption of gold on AC(activated carbon) from a chloride medium which is also referred to the noncyanic solvents. The aim of this study is to investigate the possibility of desorption of gold from saturated AC by using the facilities of the Institute of Combustion Problems and the Al-Farabi Kazakh National University. Activated carbons based on rice husks and apricot shells were selected for these studies because of their unique physico-chemical properties and structure. The possibility of gold desorption from saturated activated carbons, in the specified environments has been shown.

Carbon sorbents obtained on the basis of plant cellulose have low redox potentials from 0.20-0.25 V (Ag-AgCl reference electrode) and in relation to gold (III) ions in the hydrochloric acid medium show themselves as reducing sorbents. When gold (III) is sorbed, metallic gold is released on the surface of these sorbents. The best kinetic and adsorption properties are the sorbent obtained by the carbonization of the apricot kernel named CAK-2 (carbonized apricot kernel). The quantitative recovery (98 %) of gold (III) from the chloride medium occurs within 8 minutes, regardless of the initial gold (III) content in the solution within the studied concentrations (8.88-35.5 mg/l) [4].

References

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