Bangka's Tin Sea Sand-Fe3O4 as a Removal of Heavy Metals in By-Product of Tin Ore Processing

Anfaresi, Shofi Latifah Nuha

Putri, Intan

An experiment to investigate the adsorbent capacity of tin sand from Bangka Island Indonesia toward the lead/Pb(II) ion in lead aqueous solution either non-modified sand and magnetite-coated sand were studied using adsorption method. The adsorbent was activated with sulfide acid (H2SO4) and showed that the tin sand with the highest porosity is the sand with the low activation temperature and the fast activation time, the lowest porosity was reached with the high activation temperature and 2 hours time activation. Both of the tin sand with the highest and lowest porosity were successfully covered with magnetite (Fe3O4) using the ferrite chloride aqueous (FeCl3) (pH=13) and was found that the more amount of Fe ions coated tin sand with the higher temperature, the more Pb(II) ions were absorbed in artificial solution. It occurred in 1 hour and resulted 83.44% at the highest porosity sand and 96.67% at the lowest porosity sand. The adsorption capacity of tailing decreased and only reached 71.76% of adsorption capacity. Moreover, Bangka’s Tin Sea Sand-Fe3O4 can be used as a reusable material for adsorbing Pb2+ ions. The desorption result showed Bangka’s Tin Sea Sand-Fe3O4 could be suitable separated in pH 2 and can re-prepare to derive the new adsorbent. Keywords: tin sand, tailing, heavy metals adsorption, magnetite-coated

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