Sintesis silika macro-spere berpori terimpregnasi Cus sebagai adsorben uap merkuri

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Abstrak

[ABSTRAK
Dalam penelitian ini, silika macro-sphere berpori disintesis dengan metode sol-gel dengan katalis asam. Na2SiO3 digunakan sebagai prekursor silika, surfaktan Oleil Bis(2-HidroksiEtil) Amin digunakan sebagai template pori, dan HCl digunakan sebagai katalis asam. Silika macro-sphere berpori terbentuk melalui tahapan : hidrolisis, kondensasi, aging, pengeringan, dan kalsinasi pada suhu 300oC, yang dilanjutkan dengan impregnasi dengan CuS sebagai bahan aktif. Karakterisasi dengan XRD dan EDS terhadap silika macro-sphere berpori terimpregnasi CuS menunjukkan masuknya bahan aktif ke dalam silika macro-sphere berpori. Silika macro-sphere berpori terimpregnasi CuS digunakan sebagai adsorben uap merkuri. Reaksi adsorpsi dilakukan dengan menggunakan rangkaian sistem tertutup yang terbuat dari peralatan gelas. Adsorpsi menunjukkan hasil yang baik terhadap senyawa merkuri maupun unsur merkuri yang didasarkan pada perbedaan massa adsorben sebelum dan setelah proses adsorpsi. Adsorpsi terjadi sebagai adsorbsi kimia dan adsorpsi fisik. Nilai adsorpsi fisik yang diperoleh adalah sebesar 5,316 mg HgCl2 per gram adsorben dan 0,196 mg Hg per gram adsorben. Nilai adsorpsi kimia yang diperoleh adalah sebesar 31,363 mg HgCl2 per gram adsorben dan 23,743 mg Hg per gram adsorben.<hr> ABSTRACT In this research, porous silica macro-sphere was synthesized by acid catalyzed sol-gel method. Na2SiO3 was used as silica precursor, meanwhile surfactant Oleyl Bis(2-HydroxyEthyl) Amine was used as the template pores, and HCl was used as the catalyst. This porous silica macro-sphere was formed through the following steps: hydrolysis, condensation, aging, drying and calcination at 300oC, followed by impregnation by CuS as an active support. The characterization of CuS impregnated porous silica macro-sphere by XRD and EDS showed that CuS was successfully impregnated into porous silica macro-sphere. The CuS impregnated porous silica macro-sphere was used as mercury vapor adsorbent. The adsorption was performed using a closed system made of glassware. Its adsorption showed a good result, either in the form of a mercury compound or mercury element, based on the different weight of adsorbents before and after the adsorption processes. These adsorption occured as chemical adsorption and physical adsorption. The obtained physical adsorption values were 5.316 mg HgCl2 per gram adsorbent and 0.196 mg Hg per gram adsorbent, and its chemical adsorptions were 31.363 mg HgCl2 adsorption per gram adsorbent and 23.743 mg Hg adsorption per gram adsorbent., In this research, porous silica macro-sphere was synthesized by acid catalyzed sol-gel method. Na2SiO3 was used as silica precursor, meanwhile surfactant Oleyl Bis(2-HydroxyEthyl) Amine was used as the template pores, and HCl was used as the catalyst. This porous silica macro-sphere was formed through the following steps: hydrolysis, condensation, aging, drying and calcination at 300oC, followed by impregnation by CuS as an active support. The characterization of CuS impregnated porous silica macro-sphere by XRD and EDS showed that CuS was successfully impregnated into porous silica macro-sphere. The CuS impregnated porous silica macro-sphere was used as mercury vapor adsorbent. The adsorption was performed using a closed system made of glassware. Its adsorption showed a good result, either in the form of a mercury compound or mercury

element, based on the different weight of adsorbents before and after the adsorption processes. These adsorption occured as chemical adsorption and physical adsorption. The obtained physical adsorption values were 5.316 mg $HgCl_2$ per gram adsorbent and 0.196 mg Hg per gram adsorbent, and its chemical adsorptions were 31.363 mg $HgCl_2$ adsorption per gram adsorbent and 23.743 mg Hg adsorption per gram adsorbent.]