عنوان مقاله:

Gas Purification from Isopropyl Mercaptan by Catalytic Oxidation Process overWO3 Supported Multiwall Carbon Nanotubes

محل انتشار:

هفتمین کنگره ملی مهندسی شیمی (سال: 1390)

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نویسندگان:

.m farahzadi - *Department of Chemical Engineering, Tarbiat Modares University,P.O. Box ۱۴۱۱۵-۱۴۳, Tehran, Iran*

.j towfighi - *Department of Chemical Engineering, Tarbiat Modares University,P.O. Box ۱۴۱۱۵-۱۴۳, Tehran, Iran*

a mohamadalizadeh - *Department of Chemical Engineering, Tarbiat Modares University,P.O. Box ۱۴۱۱۵-۱۴۳, Tehran, Iran.*

خلاصه مقاله:

catalytic oxidation of isopropyl mercaptan (IPM) with the purpose of its removal from a gas stream containing n-hexane, He and O2, have been investigated in this work. Multi-Wall Carbon Nanotubes (MWNTs) decorated with tungsten oxides nano particles were selected to catalyzemercaptan oxidation process. The catalysts were synthesized and characterized by XRD, SEM, TEM, BET, ICP tests. Moreover, the effects of temperature, catalyst loading, Gas Hour SpaceVelocity (GHSV) and oxygen/IPM ratio on the removal of IPM from gas stream have been investigated in range 100 to 300oC, 7 to 15 wt%, 2000 to 4000 h-1, 15 to 25, respectively. Base on experimental results, mercaptan content of effluent stream was correlated with four foresaid keyfactors and their quadratic and cubic interactions by use of central composite design (CCD)experiments. The results revealed that comparing other parameters temperature has the upmost influence, in changing the mercaptan content of outlet stream (MCOS). Furthermore, nanotungsten oxide loading affect significantly the MCOS. GHSV and oxygen-to-IPM ratio were found to be effective parameters on change MCOS that Former had more significant effect than later. In addition, it was reported that at optimum operating condition of 246°C, metal loading of 11.5 wt%, GHSV of 2587 h-1 and oxygen-to-IPM ratio of 21, conversion of mercaptan to products was near 100% even 220 min after beginning of reaction

کلمات کلیدی:

Gas stream, Multi Wall Carbon nanotube, Isopropyl mercaptan, Catalytic Oxidation,experiment design