A study on the new adsorbents for the removal of the sulfur compounds from the C4 gases in the FCC process

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To remove sulfur compounds, such as methyl mercaptan (4 ppm), ethyl mercaptan (1 ppm), dimethyl disulfide (14ppm) and diethyl disulfide (1ppm) from C4 gases in FCC process, the activated carbon based adsorbents (ACs) and zeolite based adsorbents with various additive metals were tested in micro reactor at 1 atm at 30oC. AC adsorbent prepared by impregnation with potassium (KAC-30) perfectly removed all the sulfur compounds until breakthrough point and the amount of the sulfur adsorption of KAC-30 was 56.2 (mg S/g adsorbent*100). Ultra stable Y zeolite(USY) perfectly removed ethyl mercaptan, dimethyl disulfide and diethyl disulfide except methyl mercaptan. The removal ability of USY for methyl mercaptan sharply decreased during the experiment even though the removal ability of dimethyl disulfide was much better than KAC-30. To improve removal ability of sulfur compounds, new adsorbents was prepared by the mixing KAC-30 with USY. The removal ability of new adsorbents was increased more than one and half times compared with single KAC-30 adsorbent.