

硅沸石完美骨架上的吸附Ⅲ.氯氟烃在MFI和FAU上的吸附热

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 测定不同温度下三种氯氟烃F-11(CFC13),F-12(CF2Cl2)和F-22(CHF2Cl)

在疏水高硅MFI和FAU沸石上的吸附等温线,以研究其吸附热效应。根据Clapeyron-Clausius方程,

由吸附等温线,计算不同覆盖度C的等量吸附热 $Q_{st}(C)$ 和平均吸附热 Q_{st}^*

(ΔH_a)。上述吸附质在两种沸石上吸附热的大小顺序均为: $\Delta H_a(MFI) > \Delta H_a(FAU)$ 。在同种沸石上,

吸附热的大小顺序为: $\Delta H_a(F-11) > \Delta H_a(F-12) > \Delta H_a(F-22)$ 。298K时的吸附等温线和 ΔH_a 的变化趋势显示,

对能允许氯氟烃分子自由进出其孔道的FAU沸石,吸附质分子越大,低分压吸附量(V)越大,吸附热(ΔH_a)

也越大。而孔道对吸附质分子有空间限制作用的MFI沸石,其吸附热、分子尺寸与饱和吸附量(V_m)

间关系比较复杂。选择去除氯氟烃的沸石吸附剂应综合考虑 ΔH_a 与饱和吸附容量 V_m 。

关键词 [硅沸石](#) [吸附](#) [氯氟烃](#)

分类号 [0647](#)

Adsorption on siliceous zeolites with perfect framework III. adsorption heat of chloro-fluoro-hydrocarbons on MFI and FAU zeolite

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Abstract The adsorption isotherms of F-11(trichloro-fluoromethane), F-12 (dichloro-difluoromethane) and F-22(chloro-difluoromethane) were measured at various temperatures on hydrophobic high silica MFI and FAU zeolites in order to investigate thermal effect of the adsorption. The isosteric adsorption heat $Q_{st}(C)$ and average isosteric adsorption heat $Q_{st}^*(\Delta H_a)$ under various coverage of the adsorbates were calculated by using Clapeyron-Clausius equation on the isotherms of adsorption. The order of the adsorption heats for all adsorbates on the zeolites investigated is $\Delta H_a(MFI) > \Delta H_a(FAU)$. The order of the adsorption heats of certain adsorbate on each zeolite is as follows: $\Delta H_a(F-11) > \Delta H_a(F-12) > \Delta H_a(F-22)$. The molecules of the adsorbate can get in and out the cavities of FAU zeolite freely. In such cases it is found that the larger the molecule size the higher of the adsorption capacity and the ΔH_a according to the comparison of ΔH_a at low pressure and the isotherms measured at 298K. On the other hand, the relationship of ΔH_a , molecule size and the saturated adsorption capacity (V_m) is uncertain in the situation of MFI zeolite, since there exists a space restriction for the adsorbed molecules. Two factors. ΔH_a and V_m should be considered simultaneously for searching the effective adsorbent to remove chloro- fluoro-hydrocabons.

Key words [SILICALITE](#) [ADSORPTION](#)

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