化学学报 1992 50 (7): 637-643 ISSN: 0567-7351 CN: 31-1320/06

# ^29Si,^27AIMASNMR研究不同脱铝深度稀土 超稳Y沸石中Si、Al的分布

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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 本文应用^29Si,^27AIMASNMR和XRD技术,测量了四种不同脱铝深度的稀土超稳Y沸石的骨架硅铝比,得到了一致的结果,并研究了稀土超稳Y沸石的脱铝过程和稀土离子和Y沸石骨架铝的机理.
发现稀土离子存在时,Y沸石骨架中Si、Al的分布与相同硅铝比的H Y不同,在浅、中度脱铝时,主要脱除的是Si(2Al)和Si(3Al)中的铝,深度脱铝时,主要是Si(1Al)和少量Si(2Al)中的铝,而Si(3Al)几乎不变,
提出稀土离子最可能是位于方钠的Si(3Al)附近,平衡三个AlO 四面体上的负电荷,起到稳定Si(3Al)结构单元的作用.
其次,稀土超稳Y沸石中总的非骨架铝(N~Al)~EF,随脱铝深度的增加而增加,仅只在REUSY-38的^27AIMAS NMR谱中观察到Al^3+非骨架铝的存在.^29Si,^27AIMASNMR

关键词 沸石 X射线衍射分析 核磁共振谱法 硅同位素 稀土 铝同位素

分类号 0612

## The distribution of si and al of reusy zeolites with the different degree of dealumination by ^29si and ^27 ai masnmr

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**Abstract** For four REUSY zeolites, the framework (Si/Al)F ratio were measured by 29Si MAS, NMR, XRD, techniques, and obtained good results. The change of distribution of Si and Al of framework during dealumination and the mechanism of stabilizing the framework aluminum by rare-earth ions were also investigated by 29Si MAS-NMR. When the range of (Si/Al) is from 2.6 to 4.0, the aluminums in Si(2Al) and Si(3Al) are mainly removed, if the (Si/Al)F is from 4.0 to 6.0, the aluminums removed are mainly that of Si (1Al) and a little of Si (2Al). Comparing the relative populations of Si(OSi)4-n (0Al)n in framework structure of REUSY zeolites with that of in framework of HY zeolite, the distribution of framework Si and Al for both Y zeolites are very different, particularly for Si (3Al) in REUSY zeolites, its relative population are changed slightly at the whole range of dealumination.

**Key words** ZEOLITE X-RAY DIFFRACTION ANALYSIS NMR SPECTROMETRY SILICONE ISOTOPES RARE EARTH ALUMINIUM ISOTOPES

DOI:



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