

ABSTRACT

**EXCHANGED ZEOLITES X, IN PARTICULAR EXCHANGED WITH
LITHIUM, THEIR PROCESS OF PREPARATION AND THEIR USE AS
ADSORBENTS OF NITROGEN IN THE SEPARATION OF
THE GASES OF THE AIR**

The present invention relates to zeolites X which have been exchanged with lithium and di- and/or trivalent cations.

According to the invention there is provided an X type zeolite having an Si/Al atomic ratio of less than 1.5, the exchangeable cations of which comprise, referred to as equivalents,

- from approximately 50 to approximately 95% of lithium ions,
- from approximately 4 to approximately 50% of trivalent aluminium, scandium, gallium, iron(III), chromium(III), indium, yttrium, lanthanide or rare earth metal ions, or a mixture thereof, and/or of divalent calcium, strontium, zinc, copper, chromium(II), iron(II), manganese, nickel or cobalt ions, or a mixture thereof, and
- 0 to approximately 15% of sodium, potassium, ammonium or hydronium ions, or a mixture thereof, which is capable of being obtained by a process comprising

- a) suspending the zeolite in water,
- b) exchanging the exchangeable cations of the suspended zeolite with one or more di- and/or trivalent ions by simultaneously and/or successively contacting in a mixer, the suspension with one or more solutions comprising compounds of the di- and/or trivalent ions, and
- c) exchanging the exchangeable cations of the zeolite resulting from stage b) with lithium.

The zeolites according to the present invention have improved thermal stability and crystallinity with respect to zeolites of the prior art with the same degree of exchange of lithium and of di- and/or trivalent cations. They are particularly effective as adsorbents of the nitrogen present in various gas mixtures and are well suited to the noncryogenic separation of the gases of the air.