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# Preparation and Properties of Large-Pore La-Al-Pillared Montmorillonite

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**Abstract:** Large-pore La-Al-pillared montmorillonite was prepared by reacting montmorillonite with hydrothermally treated mixtures of aluminum chlorohydrate and lanthanum chloride. The large-pore La-Al-pillared montmorillonite is characterized by basal spacings of about 26 Å, surface areas of 300–500 m<sup>2</sup>/g, and pore volumes in the range 0.2–0.3 cm<sup>3</sup>/g. Large-pore pillared montmorillonite products were obtained from solutions refluxed for > 72 hr or treated in autoclaves at 120°–160°C for 12–96 hr. The most favorable pillaring solution for the production of large-pore La-Al-pillared montmorillonite had an OH/Al ratio of 2.5, a La:Al ratio of 1:5, and was 2.5 M with respect to Al. The elemental composition of large pore La-Al-pillared montmorillonite is similar to that of a conventional Al-pillared montmorillonite that has a basal spacing of about 19 Å. The 26-Å spacing is believed to be associated with the formation of large polymeric La-bearing Al-cations upon hydrothermal treatment of the solutions.

**Key Words:** Aluminum • Cross-linked smectite • Lanthanum • Montmorillonite • Pillared interlayer complexes • X-ray powder diffraction

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