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# **<sup>19</sup>F MAS-NMR Study of Structural Fluorine in Some Natural and Synthetic 2:1 Layer Silicates**

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**Abstract:** High-resolution solid-state, fluorine-19, magic-angle spinning-nuclear magnetic resonance spectroscopy (MAS-NMR) was used to study natural and synthetic fluorinated 2:1 layer silicates of known composition. This technique enabled us to determine directly the coordination of structural fluorine and it was found to be sensitive to both the chemical nature of the octahedral elements (Al, Mg, Li) and the type of octahedral sheet (di- or trioctahedral). The observed chemical shifts at -132, -152, -176 and -182 ppm (relative to CFCl<sub>3</sub>) were assigned to different environments of fluorine. The results were then used to characterize synthetic 2:1 layer silicates with unknown octahedral composition.

**Key Words:** Clay minerals • <sup>19</sup>F MAS-NMR • Fluorine • Layer silicates • Silicates • Smectites

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