t1About the synthesis and magnetic behavior of new layered oxides structurally related to natural micas

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Layered silicates are common components of many soils, so they arouse much interest in geology and mineralogy areas. In addition, phyllosilicates such as smectites constitute a naturally occurring class of inorganic catalyst and are studied for their interesting properties including cation exchange, intercalation and swelling [1]. These earth's crust compounds can be used as structural models to develop new functional materials. For example we have evidenced that it is possible to synthesize some new layered oxides structurally related to natural phyllosilicates such as biotite or phlogopite mica : the phyllosiloxides [2,3]. This new class of layered oxides was expanded to three new compositions : $KMq_2Fe^{3+}Si_4O_{12}$, $KFe^{2+}AISi_4O_{12}$, and $KFe^{2+}Fe^{3+}{}_{3}Si_{3}O_{12}$. The sol-gel route was adopted to prepare a precursor and the polycrystalline samples were obtained by solvothermal treatments at 750°C/650MPa. The three powder X-ray diffraction patterns were successfully indexed by 1M polytype of mica. Platelet morphologies of these samples were observed through the images of scanning electron microscopy. Mossbauer spectroscopy and squid measurements have been performed to determine the magnetic behavior of these compounds which will be discussed as a function of the repartition of transition ions in the materials.

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