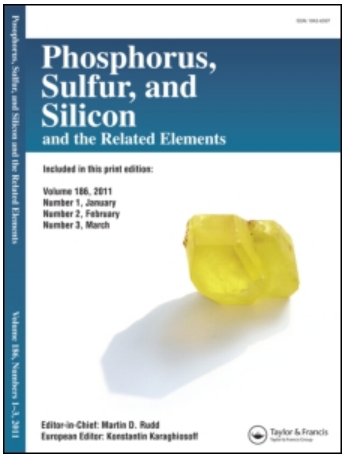

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Influence of $MgHPO_4 \cdot 3H_2O$ and $Mg_3(PO_4)_2 \cdot 8H_2O$ on Thermal Reactions (20°-1000°C) in Solid Solutions with $Al_2(SO_4)_3 \cdot 16H_2O$

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The following binary systems were studied: $Al_2(SO_4)_3 \cdot 16H_2O$ - $MgHPO_4 \cdot 3H_2O$ and $Al_2(SO_4)_3 \cdot 16H_2O$ - $Mg_3(PO_4)_2 \cdot 8H_2O$.

Weighed substrates were grounded in mortar for about 15 minutes, sieved through 400μm. sieve and then combined into mixtures of molar percentage ratios 10-90% and at molar ratios 1:1, 1:2 and 2:1. Both substances and binary mixtures were heated in electric furnace for one hour at temperatures 500°C and 1000°C.

The temperature dependent X-ray diffraction (TDXD) and ordinary X-ray diffraction methods proved that substrates undergo phase changes: $Al_2(SO_4)_3 \cdot 16H_2O$ (20°-96°C)- crystalline phase, amorphous phase (96°-382°C), which crystallises as $Al_2(SO_4)_3$, and after heating to 1000°C transforms into γ-Al_2O_3, while $MgHPO_4 \cdot 3H_2O$ at the temperature (20°-88°C) is crystalline then amorphous (88°-612°C) and heated up to 1000°C becomes $Mg_2P_2O_7$. At the temperature (20°-86°C) $Mg_3(PO_4)_2 \cdot 8H_2O$ is crystalline then becomes amorphous compound (86°-636°C) and finally recrystallises as $Mg_3(PO_4)_2$- $Mg_2P_2O_7$.

It has been X-ray and IR proved that binary mixtures (at ratios of 50% of each substrate) with the change of the temperature undergo the following changes:

$Al_2(SO_4)_3 \cdot 16H_2O$ - $MgHPO_4 \cdot 3H_2O$ (20°C), amorphous (138°-396°C), $Mg_2P_2O_7$, $Al_2(SO_4)_3$ (500°C), γ- Al_2O_3, $Mg_3(PO_4)_2$, $Mg_2P_2O_7$(1000°C).

$Al_2(SO_4)_3 \cdot 16H_2O$ - $Mg_3(PO_4)_2 \cdot 8H_2O$ (20°C), amorphous (114°-324°C), $Al_2(SO_4)_3$ $Mg_3(PO_4)_2$ (500°C), $MgAl_2O_4$ (spinel), MgAlO (1000°C).