

I3 13:00 – 13:40

Solid State Chemistry and Materials Science

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Development of new needs related to better living standards requires novel materials. Most of them are metastable in customary conditions.

Several elaboration methods will be considered: preparation of materials in stable conditions but becoming metastable by quenching, materials metastable all the way and chemical modifications of stable species.

Most of the last reactions are topotactic, which means that the strong bond framework will be preserved. Examples will be discussed: by hydrolysis and dehydroxylation, ion exchange, electrochemical and chemical intercalation, pillaring, and acid leaching.

Electronic aspects of some of those reactions will be considered, in particular competition between cationic and anionic oxidoreduction.

In the last section of the talk new composite materials with exceptional physical or mechanical properties will be described with their industrial applications.