Team: Solid State Chemistry of F-based compounds

3 research topics:
- Synthesis, crystal structure and chemical-physical properties
- Reactivity and electronic properties
- UV-Visible-NIR absorption properties

Keywords: inorganic synthesis, direct F_2 fluorination, thermal analysis under F2, hydrothermal, solvothermal, microwave, nanostructured F-based materials, crystal structure,

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Title: Fluoride materials, reactivity and optical properties

Method: Microwave-assisted solvothermal synthesis, F₂, HF fluorination (up to 10 bars and T=600° C), Radio-frequency Plasma fluorination (CF₄, C₄F₈, ...), TGA coupled MS and FTIR under elemental fluorine F₂, Autoclave for 500g synthesis (scale-up) and furnace under vacuum or Ar (T<500° C)

Collaborations: IMMM, Le Mans, PHENIX, Paris, Kageyama Lab, Kyoto University, JP, SOLVAY Gmbh FLUOR, Hannover, DE

TOPICS: - Synthesis and structural features of mixed anions compounds (F, O, H, S, ...)
- Synthesis and characterization of nanostructured fluorides
- Surface treatment of materials using fluorinated plasma and gas phase
- Reactivity of fluorides under elemental fluorine (generation of F₂ and chemical storage)
- Thermal stability of inorganic fluorides
- Following the thermal events during the synthesis of inorganic fluorides
- Fluoride materials for nuclear industry
- Fluoride materials for batteries
- Fluoride materials as UV-Visible-NIR pigments, luminescence and photovoltaïcs
- Fluoride materials for heterogeneous catalysis