

SOLID STATE NMR STUDY OF HYBRID CALCIUM PHOSPHATES

Rokas Lemežis¹, Vytautas Klimavičius¹

¹Institute of Chemical Physics, Faculty of Physics, Vilnius University
rokas.lemezis@ff.stud.vu.lt

Calcium phosphates (CaPs) are a family of materials used for various applications such as bone regeneration, etc. Properties such as biocompatibility, bioactivity, and osteoconductivity are necessary for CaPs in bioapplications. Macroscopic properties and structures at the molecular level need to be investigated to determine newly synthesized CaPs applications.

In this study, solid state Nuclear Magnetic Resonance (NMR) was used to investigate 6 samples composed of calcium chlorapatite ($\text{Ca}_5(\text{PO}_4)_3\text{Cl}$) or goryainovite ($\text{Ca}_2(\text{PO}_4)\text{Cl}$). Samples were synthesized using different synthesis methods. ^{31}P and ^1H MAS BMR spectra were used to determine materials present in samples. Samples also were vacuumed to minimize the intensity of physisorbed/chemisorbed H_2O spectral line in ^1H MAS BMR spectra.

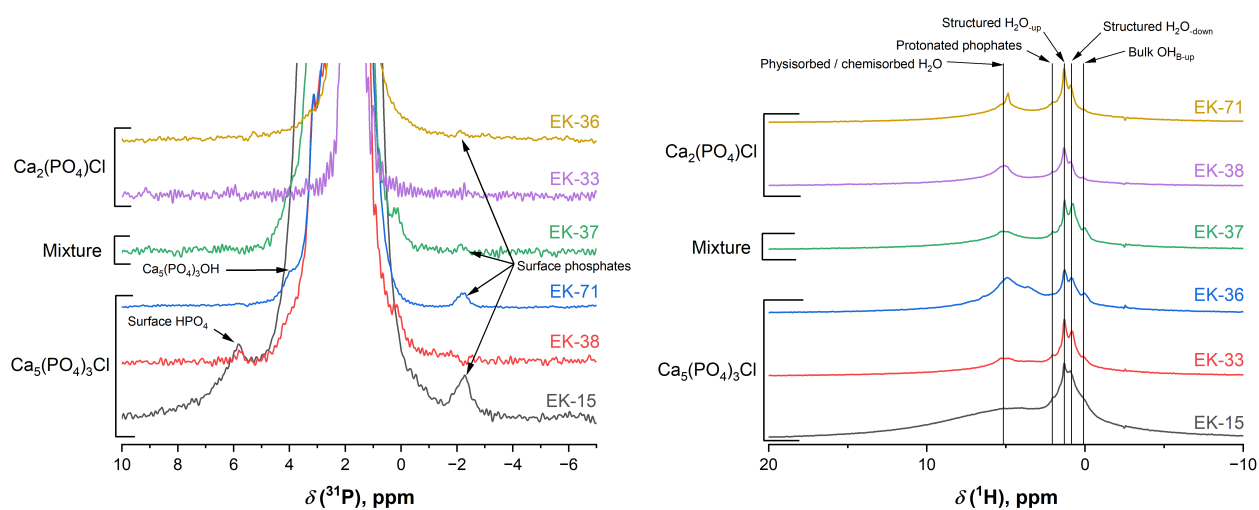


Fig. 1. ^{31}P (left) and ^1H (right) MAS BMR spectra with identified spectral lines.

It was found that surface phosphates, structured and physisorbed/chemisorbed H_2O and protonated phosphates were present in the samples.