

# **$^1\text{H}$ NMR, $^{31}\text{P}$ NMR and Raman Study of $\text{CaHPO}_4$ and $\text{SrHPO}_4$**

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$\text{CaHPO}_4$  and  $\text{SrHPO}_4$  were investigated using Raman,  $^1\text{H}$  NMR and  $^{31}\text{P}$  NMR techniques to study the environment of their  $\text{PO}_4^{3-}$  tetrahedra and the percentage of mobile protons.  $^1\text{H}$  NMR spectra at room temperature suggest the presence of three types of protons, in agreement with RX investigation. The percentage of mobile protons in  $\text{SrHPO}_4$  is greater than in  $\text{CaHPO}_4$  because  $\text{Sr}^{2+}$  is bigger than  $\text{Ca}^{2+}$ .  $^{31}\text{P}$  NMR spectra at room temperature show two lines in the spectrum of  $\text{SrHPO}_4$ , revealing an equal environment of two sets of pairs of  $\text{PO}_4^{3-}$ . The  $^{31}\text{P}$  NMR spectrum of  $\text{CaHPO}_4$ , however, exhibits three lines. This result was confirmed using a cross polarization (CP) sequence program. The first peak is attributed to the first set of pairs of  $\text{P}(1)\text{O}_4$  units and the two other ones to  $\text{P}(2)\text{O}_4$  and  $\text{P}(2')\text{O}_4$  units.

*Key words:* Raman Spectroscopy;  $^1\text{H}$  and  $^{31}\text{P}$  NMR Investigation.