



## On precipitated calcium and magnesium phosphates during synthetic hard waters softening by monosodium phosphate

A.S. Manzola<sup>a,\*</sup>, A. Mgaidi<sup>b</sup>, M.S. Laouali<sup>a</sup>, M. El Maaoui<sup>b</sup>

<sup>a</sup>Laboratoire de Chimie Analytique et Minérale, Faculté des sciences, Université Abdou Moumouni, BP 10662 Niamey, Niger

Tel. +227 20315072; Fax: +22720315862; email: [abdoussalam\\_manzola@yahoo.com](mailto:abdoussalam_manzola@yahoo.com)

<sup>b</sup>Laboratoire de Chimie Minérale Industrielle, Faculté des sciences, Université de Tunis, El Manar, BP 37, El Belvédère 1002, Tunis, Tunisia

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### ABSTRACT

Phosphates were largely used to soften process or drinking waters. We have investigated the precipitation of  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions by monosodium phosphate dehydrate. Magnesium phosphate starts precipitating at  $\text{pH}_0=8.6$ . The obtained solids have been identified by chemistry analyses, FTIR spectroscopy, X-ray diffraction, thermo gravimetric analysis and differential thermal analysis. The solid phases obtained vary with  $\text{pH}_0$ . It shows that DCPD (dicalcium phosphate dehydrate,  $\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$ ) precipitated within  $\text{pH}_0$  5 to 6.6, the TCP (tricalcium phosphate) and other apatite appear below  $\text{pH}_0=7$ . The DCPD (dicalcium phosphate dihydrate,  $\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$ ,) precipitated was a pure product that can be used in nanotechnology and biomedical technology. We are presently testing these solids for natural waters defluoridation.

*Keywords:* Softening; Synthetic hard waters; Settling time; Calcium; Magnesium; Phosphates; Solid phases

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\*Corresponding author.