

Supporting Information: **How high concentrations of proteins stabilize the amorphous state of calcium orthophosphate: a solid-state NMR study of the casein case**

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alpha1 (37.5% total)

RPKHPIKHQGLPQEVLNENLLRFFVAPFPEVFGKEKVNELSKDIGSESTEDQAMEDIKQM
EAESSISSEEEIVPNSVEQKHQKEDVPSEERYLGYLEQLLRKKYKVPQLEIVPNSAEERL
HSMKEGIHAQQKEPMIGVNQELAYFYPELFRQFYQLDAYPSGAWYYVPLGTQYTDAPSFS
DIPNPIGSENSEKTTMPLW

BETA (37.5% total)

RELEELNVPGEIVESSSSSEESITRINKKIEKFQSEEQQQTEDELQDKHPFAQTQSLVY
PFPGPINSLPQNIPPLTQTPVWVPPFLQPEVMGVSKVKEAMAPKHKEMPFPKYPVEPFT
ESQSLTLTDVENLHLPLLLQSWMHQP HQPLPPTVMFPPQSVLSLSQSKVLPVPQKAVPY
PQRDMPIQAFLLYQEPVLPVPRGPFPIIV

Alpha2 (12.5% total)

KNTMEHVSSSEESIISQETYSQEKMAINPSENLCSTFCKEVVRNANEEEYSIGSSSEE
SAEVATEEVKITVDDKHYQKALNEINQFYQKFPQYLQYLYQGPIVLPWDQVKRNAVPI
PTLNRQELSTSEENSKKTVDMESTEVFTKTKLTEEEKNRLNFKKISQRYQKQFALPQYL
KTVYQHQAAMKPWIQPKTKVIPYVRYL

Phosphoserine **S**

EMBOSS (<http://emboss.sourceforge.net/>)

Figure 1. Casein sequences. Aminoacide lettres are higlihted in green or yellow for positives and negatives charged

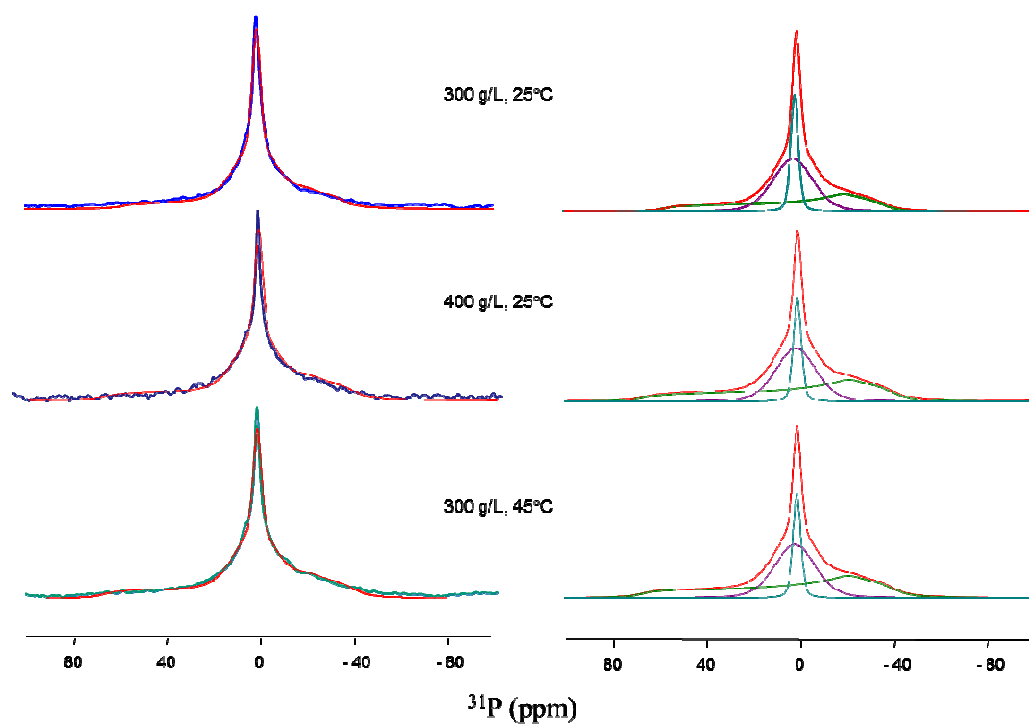


Figure 2. One dimensional ^{31}P quantitative static spectra of casein gels at different temperatures and concentrations. The red lines correspond to the simulated spectrum respectively. On the right hand side, the three components of the spectrum are displayed: a narrow Gaussian peak, $^{31}\text{P}_{\text{free}}$ (blue), a broad Gaussian peak, $^{31}\text{P}_{\text{ACP}}$ (green) and a chemical shift anisotropy (CSA), $^{31}\text{P}_{\text{pSer}}$ component (violet). No significant difference is found in the relative intensities of each component in the different conditions.

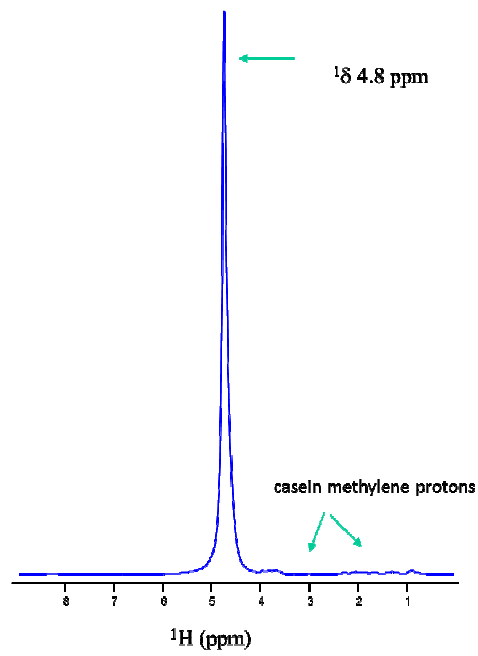


Figure 3. A 1D ^1H spectrum at MAS 5kHz, 300 g.L $^{-1}$, 25°C. The proton chemical shift of the intense water peak is 4.8 ppm.

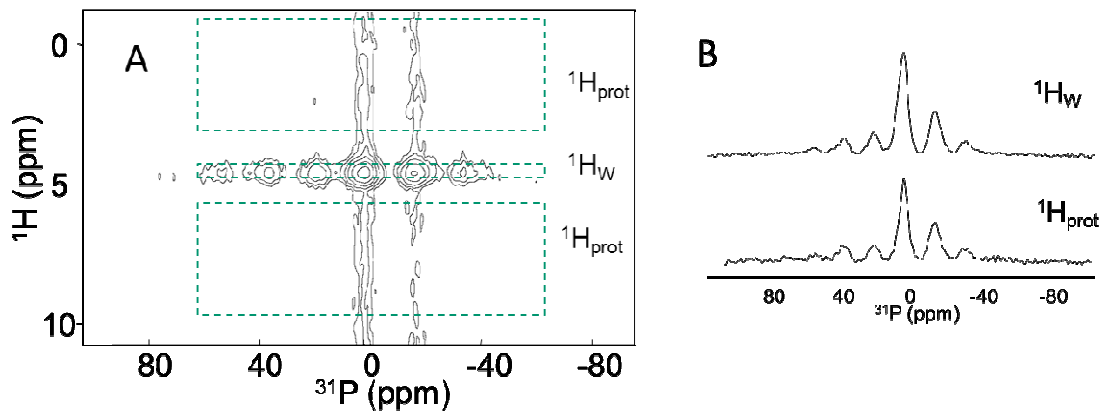


Figure 4. CP 2D ^1H - ^{31}P HETCOR spectra at 45°C (MAS 3.5 kHz) of casein gel at 400 g.L⁻¹. (A) 2D spectrum; (B) sum of ^{31}P slices extracted from the proton regions of the H₂O protons $^1\text{H}_\text{w}$ and from the protons region of protein protons