

Subject Proposal for Erasmus Students in Chemistry

"Advanced solid-state NMR characterisation of glasses"

The ENSC-Lille is involved in the development of advanced solid-state NMR characterisation methods devoted to the structural analysis of glasses and glass-ceramics. We are equipped with 4 new generation NMR spectrometers with magnetic fields of 2.34 (100 MHz), 9.4T (x2, 400 MHz) and 18.8T (800 MHz). The experiments are conducted on a large panel of probes (standards 4 mm and 7 mm, low gamma, MQ-MAS, ST-MAS, triple resonance 4 mm, 3.2 mm,...). The "NMR and glass" research group at the ENSC-Lille is composed of 7 permanent researchers involved in the development of new NMR pulse-sequences and their applications to materials.

The subject of the Erasmus training course would be the characterisation of glasses and glass-ceramics using advanced solid-state NMR methods. Recent developments, based on through space or through bonds correlations between the different nuclei, now allow for middle range order structural characterisation. These methods will be applied to silicate, borosilicate, phosphosilicate and aluminosilicate glasses (^{29}Si , ^{27}Al , ^{11}B , ^{31}P nuclei).

The project would last for 3 to 8 months, between November and July.

Key words: Advanced Solid-state NMR, High Field, Glasses, glass-ceramics.

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