

Results

Data on micellar aggregates of dihydroxy bile salts (sodium and calcium taurodeoxycholate, NaTDC, CaTDC, and glycodeoxycholate, NaGDC, CaGDC) and trihydroxy bile salts (sodium taurocholate, NaTC, and glycocholate, NaGC) have been collected. A study of the dependence of their size and shape on the concentration and ionic strength is in progress.

Due to the limited number of allocated shifts (6), the number of samples has been limited. The bile salt concentration range and the ionic strength conditions have been reduced. The study of NaTC and the study in function of pH and temperature have been discarded.

The setup of the camera allowed us to collect data in the $0.018\text{--}0.30 \text{ \AA}^{-1}$ k range. The data can be analysed for particles with a maximum dimension of 170 \AA . Several samples present strong intensity at low k values and data collection at lower k , with a higher sample–detector distance would be necessary.

From the data analysis the pair distribution function, absolute intensities at $k=0 \text{ \AA}^{-1}$ and gyration radii for the particle and for the cross section have been determined.

The main results obtained are:

- 1) The dihydroxy bile salts (NaGDC and NaTDC) present bigger aggregates than the NaGC (a trihydroxy bile salt).
- 2) At low bile salt concentration (20mM) the interaction effect is strongly reduced respect to the systems previously studied in our laboratory (with a Kratky camera) at 100 mM. Aggregation numbers, geometrical parameters and helical models of NaTDC and NaGDC can be better evaluated in micellar systems with reduced interaction effect. The results will be compared with QELS and PGSE–NMR data collected in our laboratory. This will allow to integrate the SAXS results with transport property studies [1,2].
- 3) The data for a limited number of samples containing a dihydroxy and a trihydroxy bile salt (NaGDC/NaGC and NaTDC/NaTC) have been collected. The trihydroxy salt inhibits the growth of the bile salt forming bigger size aggregates (dihydroxy salt), giving rise to a growth poisoning. The SAXS results confirm the trend of the hydrodynamic radii determined from QELS measurements [3].
- 4) Data of the dihydroxy bile salts in presence of CaCl_2 have been collected. For the same ionic strength (NaCl or CaCl_2) the presence of Ca^{2+} ions induces a strong aggregation, giving rise to aggregates with a high asymmetry.

References

- 1) Galantini L., Pavel N. V. J. Chem. Phys. 118, 2865 (2003).
- 2) Galantini L., Giglio E., Leonelli A., Pavel N. V. (2003) submitted to J. Chem. Phys.
- 3) Galantini L., Giglio E., Pavel N. V., Punzo F. Langmuir 19, 1319 (2003).