

SANS

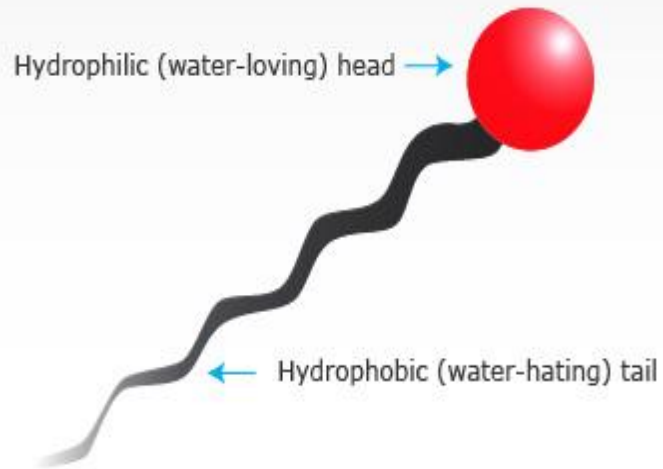
SEE INVISIBLE

Marta Zalewska

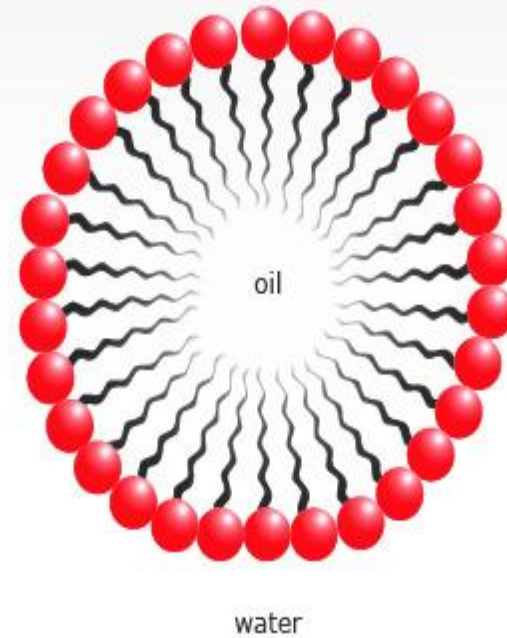
WHAT IS GOING ON ??



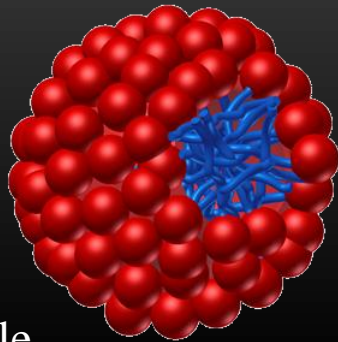
Surfactant



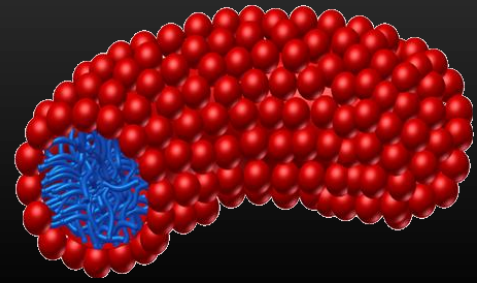
Surfactant-stabilised oil droplet



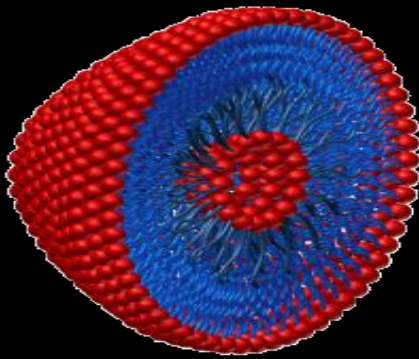




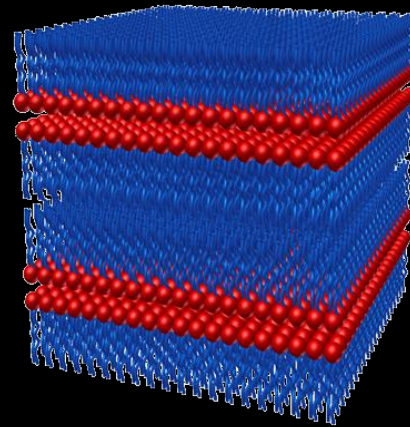
Spherical micelle



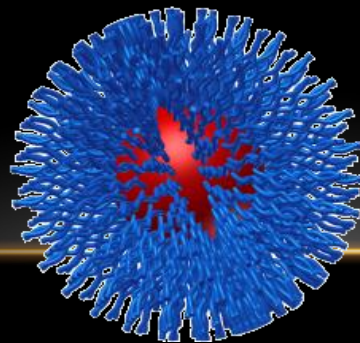
Single-chamber vesicle



Bubble



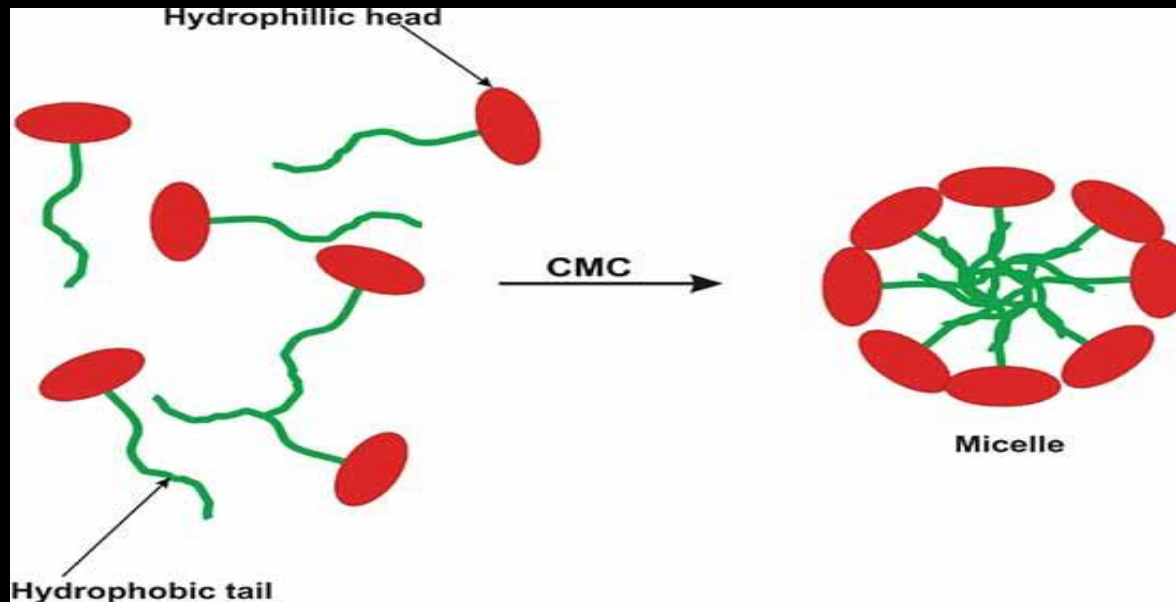
Bilayer sheet



Reversed micells

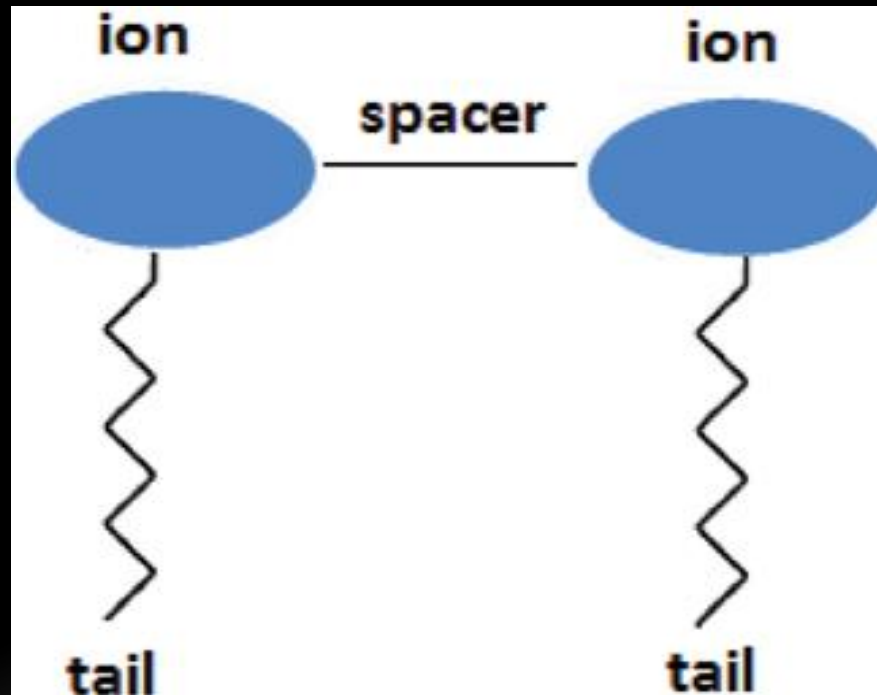
CMC - CRITICAL MICELLE CONCENTRATION

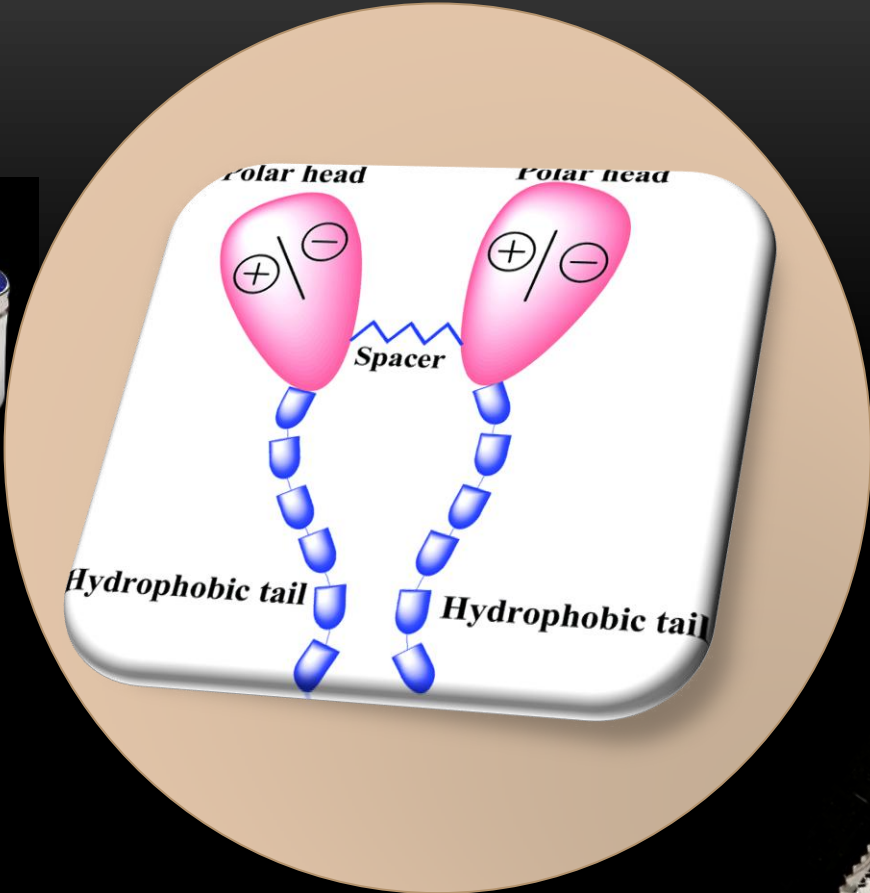
- Concentration of surfactants above which micelles form and all additional surfactants added to the system go to micelles



GEMINI SURFACTANTS

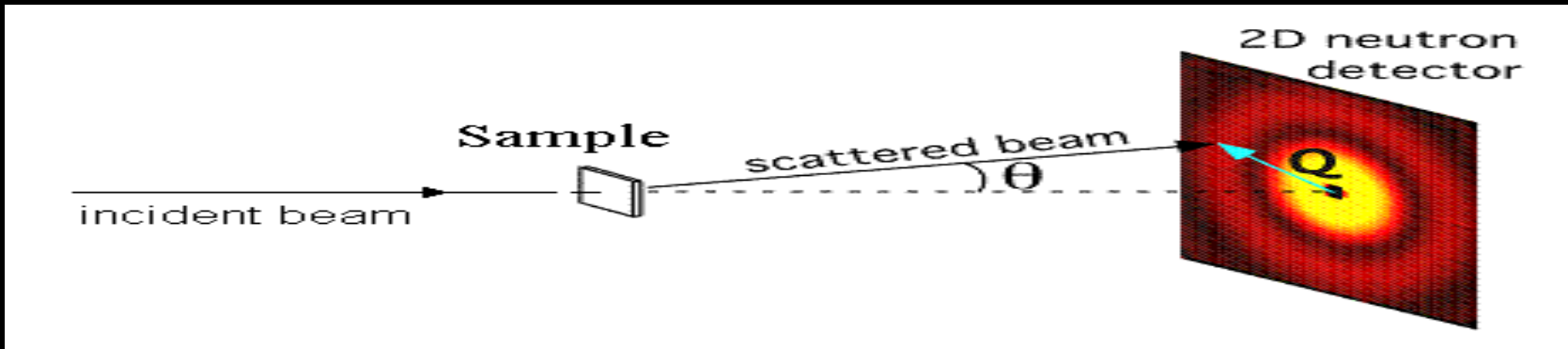
- Dimeric or gemini surfactants are a captivating class of surface active agents that are comprised of two surfactant monomers chemically linked at or near the head groups by a rigid or flexible spacer.





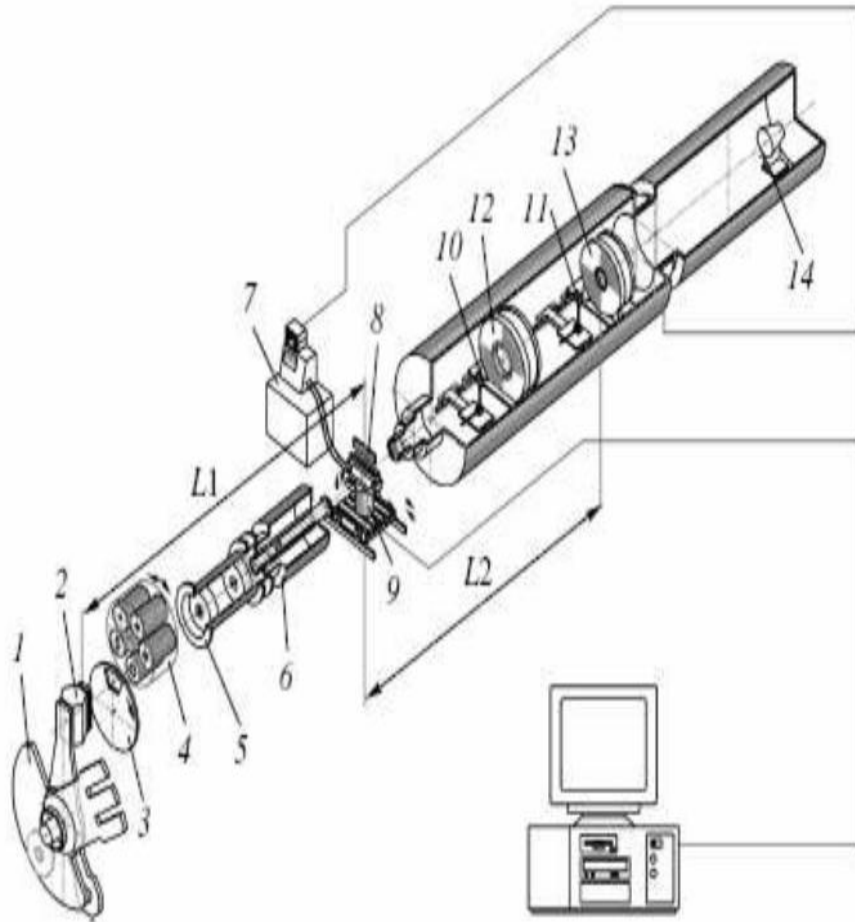
SANS METHOD

- Small Angle Neutron Scattering is a method used to investigate the properties of different materials by scattered neutrons at small angles.



$$Q = 4\pi \frac{\sin(\theta/2)}{\lambda}$$

YUMO-SANS INSTRUMENT(FLNP)



1. Two reflectors
2. Zone of reactor with moderator
3. Chopper
4. First collimator
5. Vacuum tube
6. Second collimator
7. Thermostat
8. Samples table
9. Goniometer
- 10-11. Vn-standard
12. Ring-wire detector
13. Position-sensitive detector "Volga"
14. Direct beam detector.

APPLICATIONS OF SANS

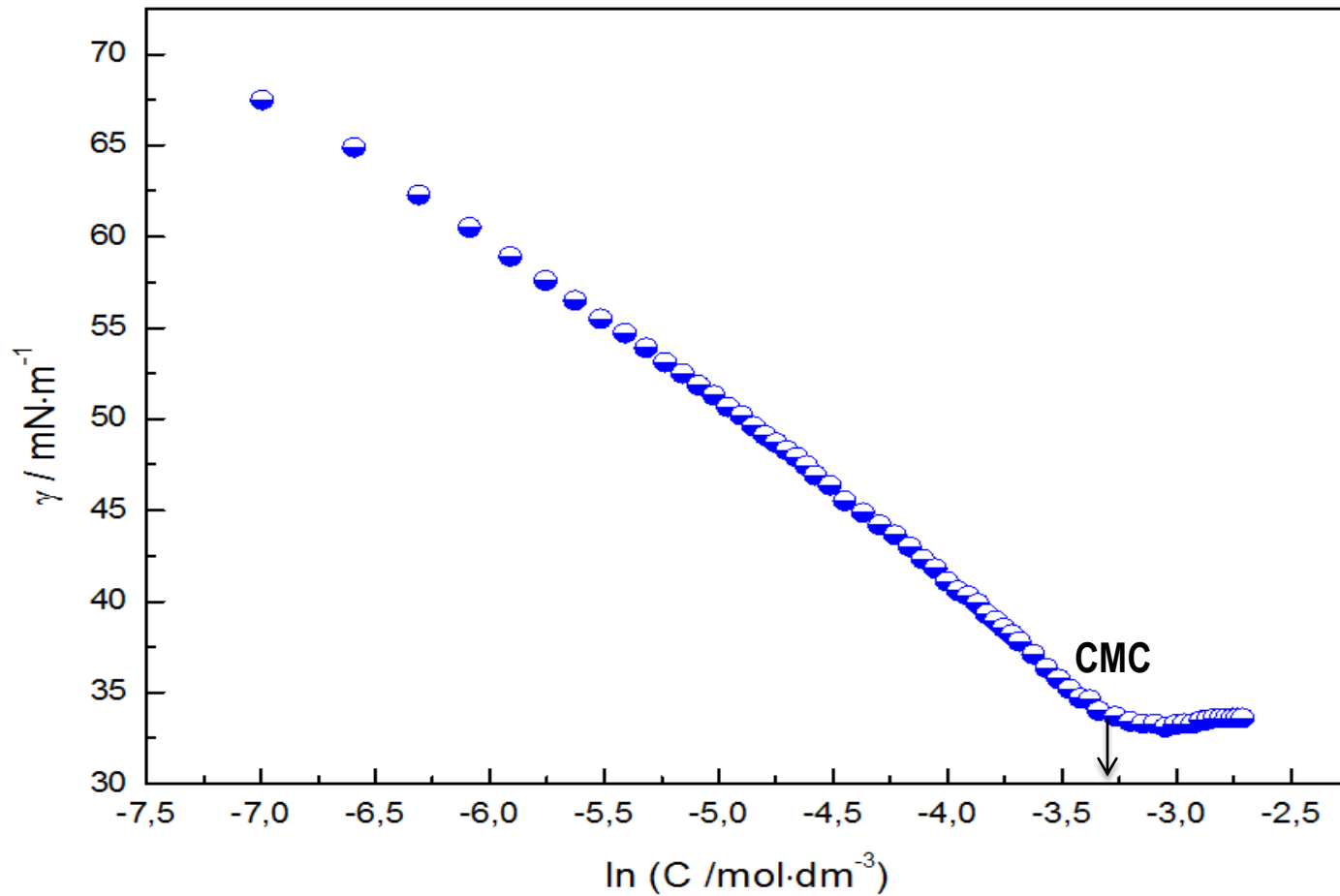
The following types of samples can be analysed using SANS, with applications across various disciplines.

- Chemistry:
 - polymers
 - precipitates
 - surfactants
 - colloids
 - gels
- Materials science:
 - alloys
 - glasses
 - composites
 - porous systems
 - grained materials
 - ceramics
 - powders
- Biology:
 - proteins
 - viruses
 - lipid aggregates
 - emulsificators

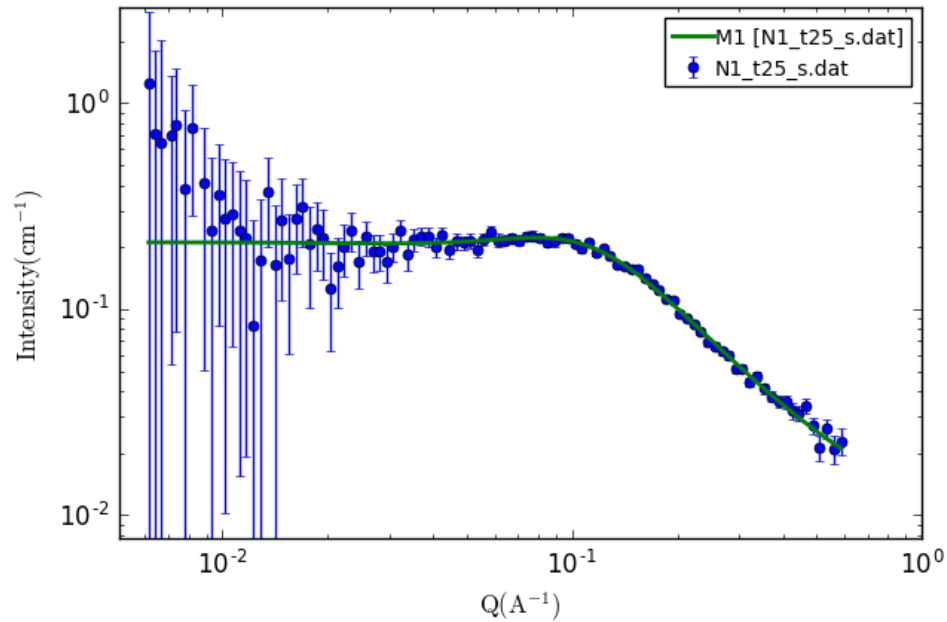


$$F = \eta 4\pi R$$

CMC - CRITICAL MICELLE CONCENTRATION



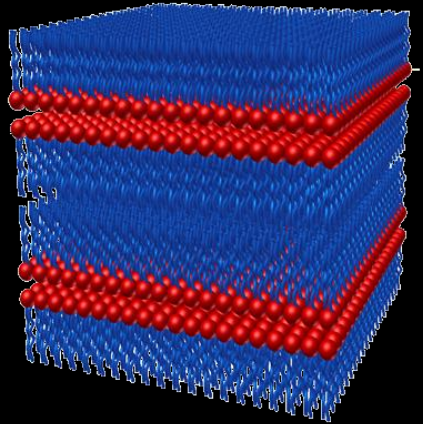
SANS RESULT

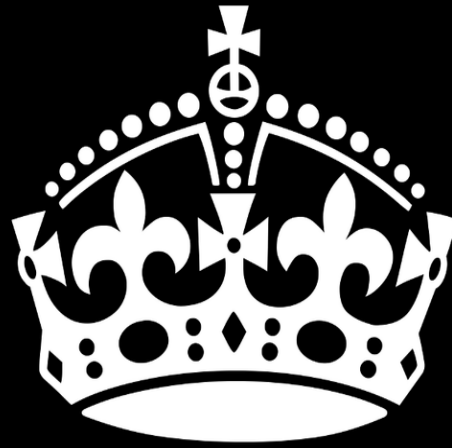


- The SANS results of surfactant 8-12-8 solution. Solid line fits according to the models for sphere like micelles.

CONCLUSIONS

- I determined the by measuring the surface tension method by ring tearing for 8-12-8 cationic gemini surfactant at 25 °C
- I described the SANS experimental curve results by using SASView program
- I concluded that the surfactant investigated creates sphere like micelles at 25 °C, the aggregation number is 16 ± 2
- The beginning of the curve suggests that the micelles have a tendency to joined together and create bigger structure
- SANS is a powerful method for condensed matter investigation for objects of sizes between 1 nm to 100 nm, which allows to specify the structure of micells





THANK YOU
FOR
your
ATTENTION!
ANY QUESTIONS?
