

EXAMEN : BACCALAURÉAT GÉNÉRAL	SESSION 2011
ÉPREUVE : Évaluation spécifique de langue en section européenne	
PHYSIQUE-CHIMIE en langue ANGLAISE	SUJET N°2

## How do soaps and detergents work in removing dirt?

Soaps and detergents are formed by special molecules, which have a hydrophilic head, which therefore loves to remain in water and a hydrophobic tail, which avoids water and loves fat substances (figure 12 A). Because of their hydrophobic tail, a part of the molecules of detergent collects to the water surface forming a monomolecular layer (figure 12 B), it lowers the surface tension of the water and makes easier its penetration into the fabrics to be cleaned. Within the water, the molecules of detergent collect themselves in *micelles* and *membranes*, little aggregates of molecules united by their hydrophobic tail (figure 12 B). When they meet dirt, these molecules surround the particles and insert their tail in them. The hydrophilic heads attract the dirt toward water and with the agitation of the liquid they contribute to remove the dirt from the fabric (figure 12 D). The crown of hydrophilic heads carries the particles of dirt in the water (figure 12 D), where they end up in suspension and

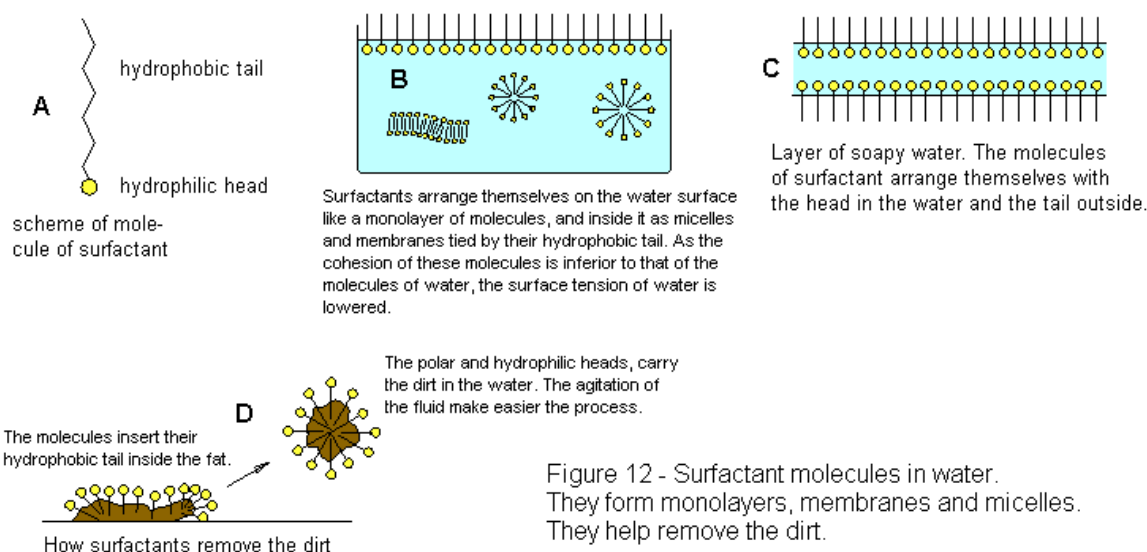


Figure 12 - Surfactant molecules in water. They form monolayers, membranes and micelles. They help remove the dirt.

then they are rinsed away. Hence, the dirt water contains also greasy particles which have been emulsified.

From : [http://www.funsci.com/fun3\\_en/exper2/exper2.htm](http://www.funsci.com/fun3_en/exper2/exper2.htm)

Questions :

1. Present and comment on this document.
2. Do not forget to focus on at least one physics and/or chemistry topic as for example the polarity of the soap molecule and its consequences, the synthesis of soap and its preparation in the chemistry laboratory.
3. What do you know about chemical synthesis in the laboratory?