2023 Ch H1 Q18

Section: Nature's Chemistry

Topic: Soaps and Detergents

Question Summary

Which line in the table best describes the ball-like structures formed when soap is added to an oil and water mixture?
A: Ionic head dissolves in water, non-polar tail dissolves in oil droplet
B: Ionic head dissolves in oil droplet, non-polar tail dissolves in water
C: Non-polar head dissolves in oil droplet, ionic tail dissolves in water
D: Non-polar head dissolves in water, ionic tail dissolves in oil droplet

Worked Solution

Soap molecules have two distinct regions:
• A hydrophilic (ionic) head that dissolves in water.
• A hydrophobic (non-polar) tail that dissolves in oil/grease. When soap is added to oil and water, the molecules arrange

into micelles: the hydrophobic tails cluster into the oil droplet, while the hydrophilic heads remain in contact with water.

Final Answer

A — Ionic head dissolves in water, non-polar tail dissolves in oil droplet

Revision Tips

• Micelles are spherical structures formed by soap in water.
• Hydrophilic head faces water; hydrophobic tail faces oil.
• This allows oils and grease to be emulsified and washed away.