

How are micelle surfactants affected by salinity?

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Abstract

How do micelle surfactants reach their activation energy, and what factors influence them to be more efficient molecules?

I wondered what was important in researching this molecule until I realized it makes up many everyday household items, such as pharmaceuticals, cosmetics, the food industry, and industrial applications. Micelle surfactants can trap and transport molecules, making them a very versatile compound. If we understand how they reach their final form, it will make the current products we use more efficient, but also, we could implement them in drug delivery and pollution removal. It is also such an important molecule that we use in everyday life that we want to know how it's able to achieve its activation energy, and with the understanding it will allow scientists to create new efficient and effective systems in different fields of science.

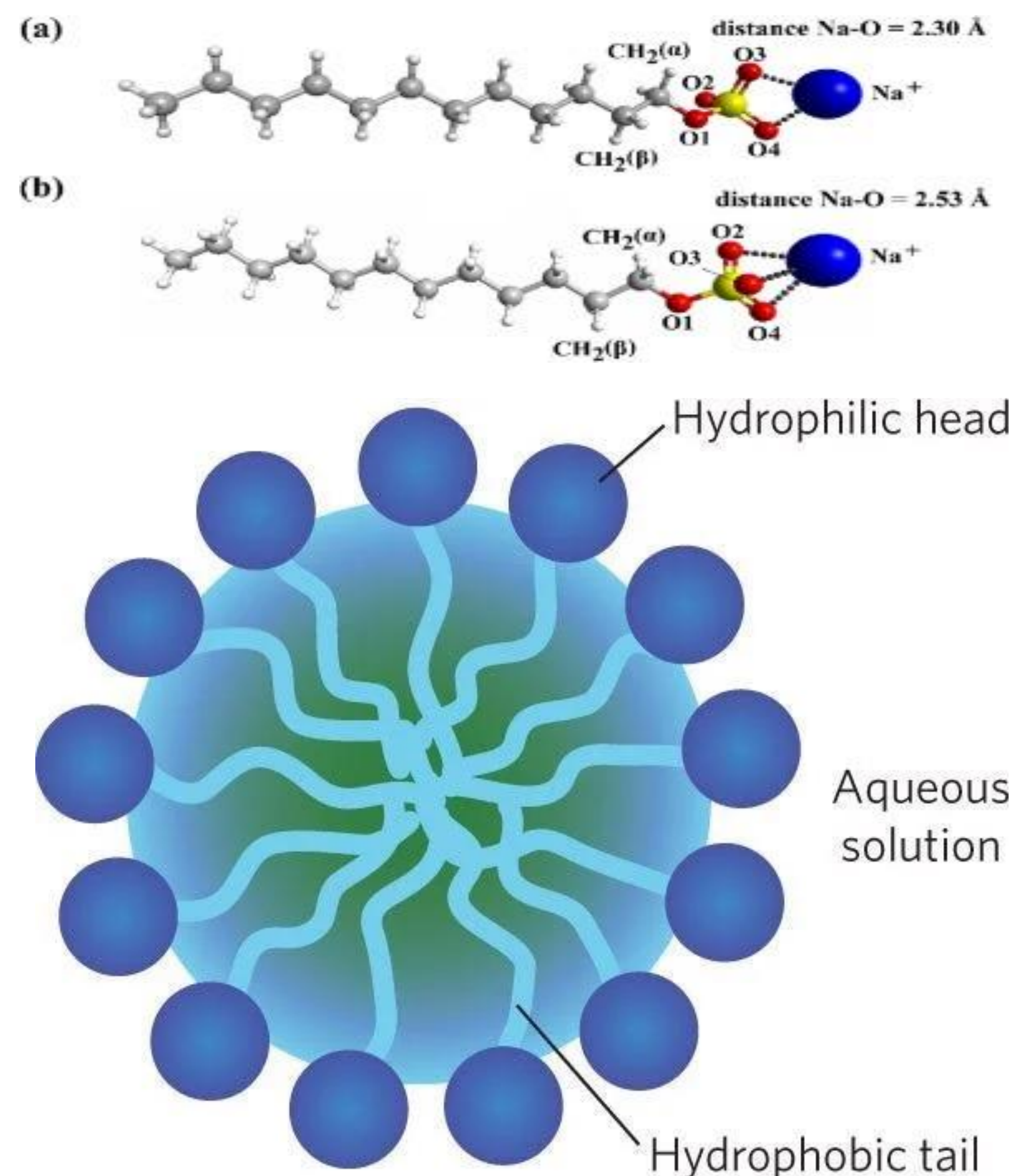
Introduction

Micelle surfactants provide great resources and a wide range of utility. Even with its wide range of use we still don't know a lot about it due to its complexity. Why is it important to research micelle surfactants?

- Oil spills remediation (Ex. Cleaning oil slicks)
- Easier drug delivery systems
- Cosmetics innovations
- Cheaper resource
- Safe molecule

What are the systems involved to research micelle surfactants?

- The use of a simulation environment to replicate a virtual lab
- Access to the supercomputer cluster
- An oil molecule (ex. Hexane)
- A visual molecular display (ex. VMD program)



Methods

- The use of 60 surfactants in an aqueous solution is used in our simulator
 - The use of a super cluster with a virtual environment important
- The use of a supercomputer allows us to manipulate variables to see the effect of density on molecule
 - With VMD allows the visualization of the molecule formation and activation energy.

Figure #1: Micelle formation

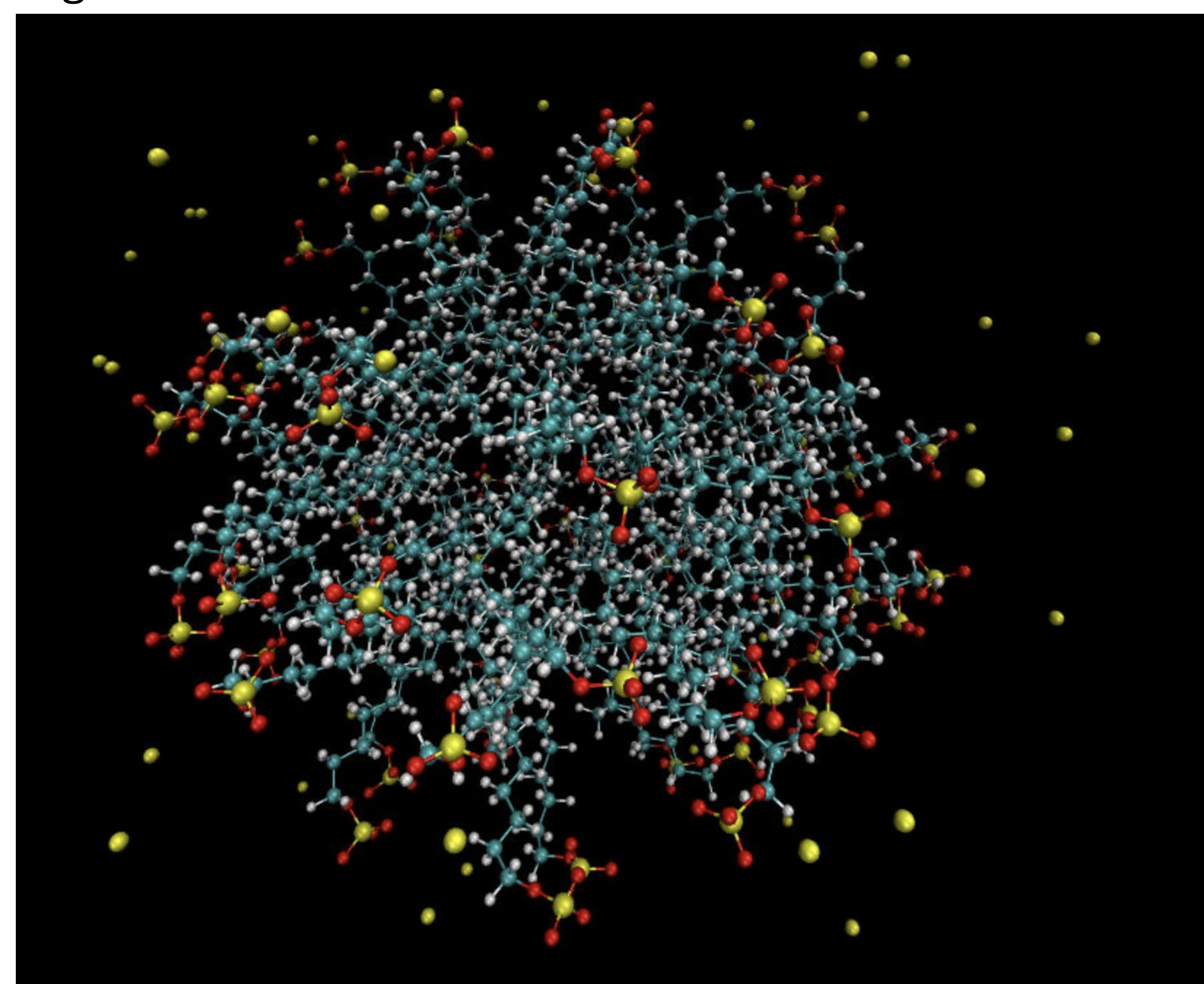


Figure #2: Simulation system of Interest

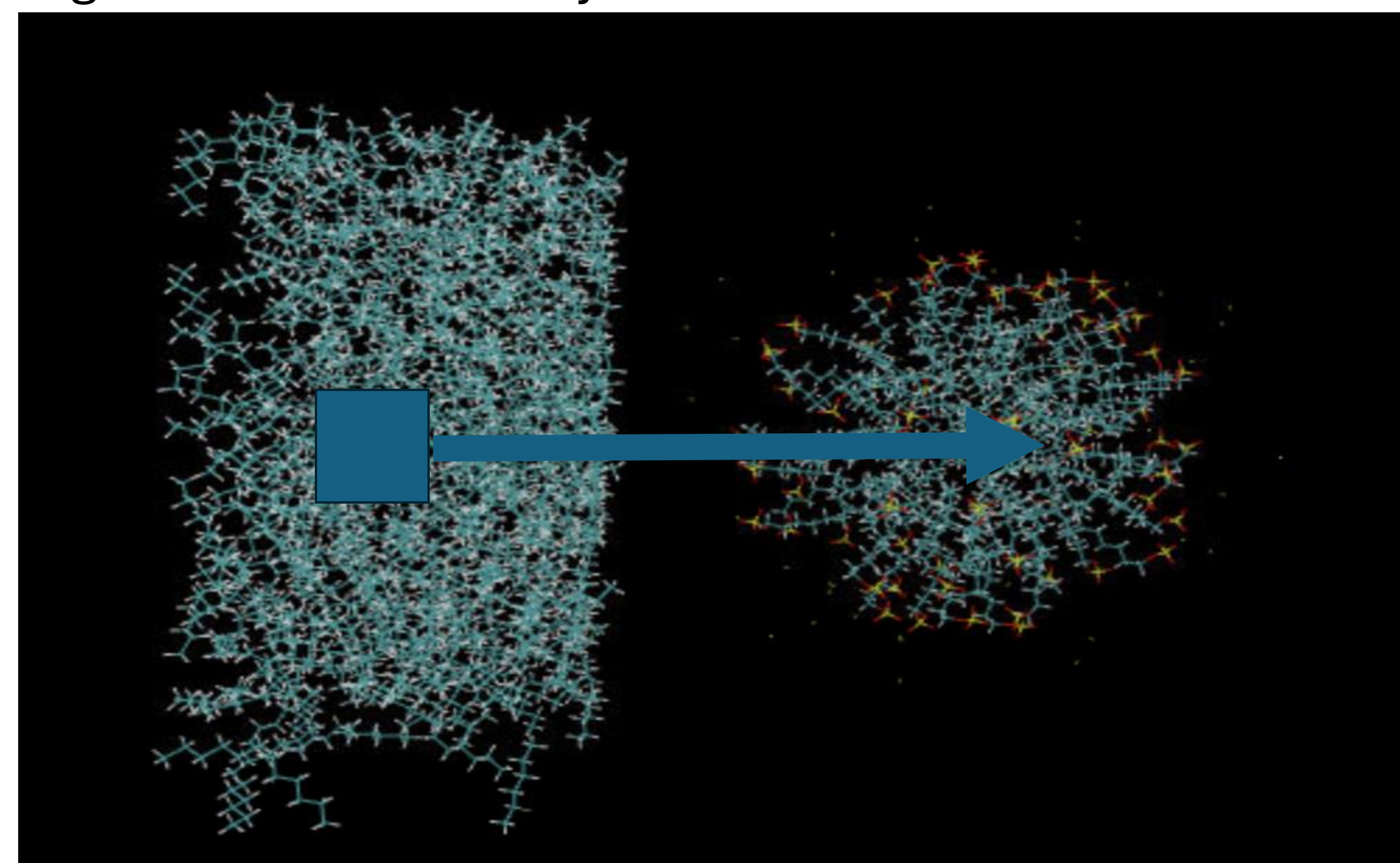
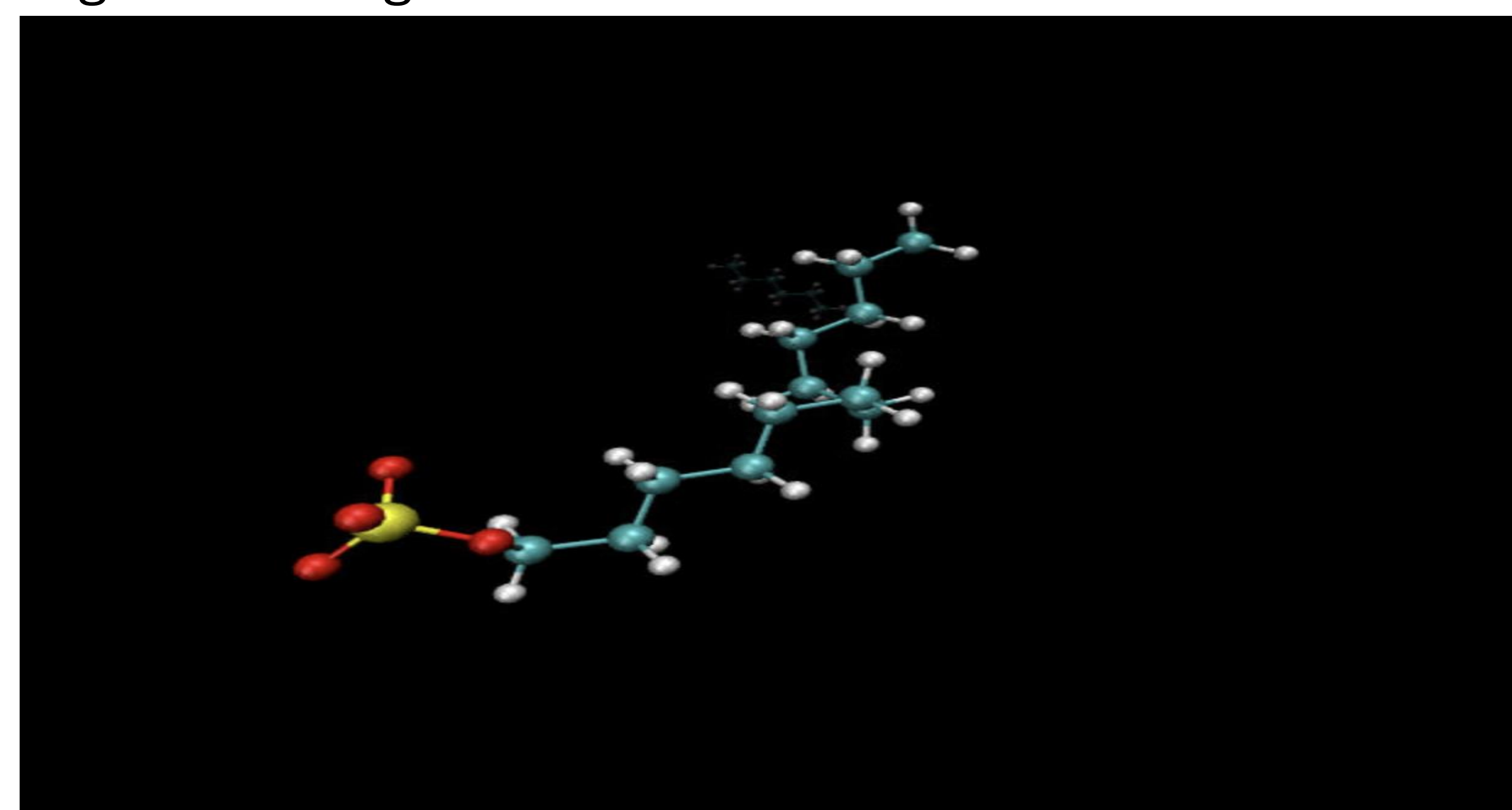


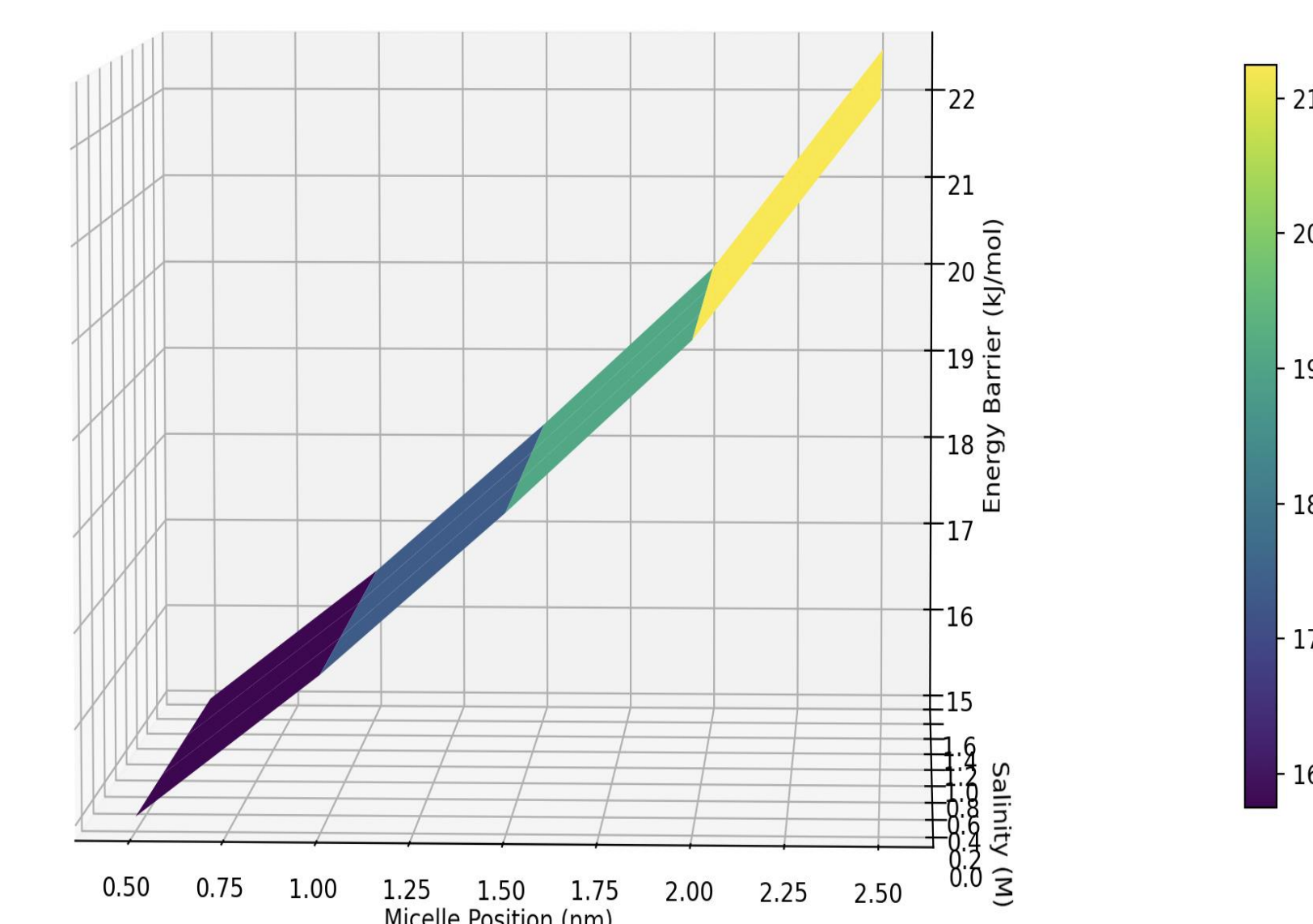
Figure #3: Single bond of micelle



Conclusion

- Salinity does not affect energy barrier
- This is used to further the current knowledge of micelle surfactants
- We can look at other variables necessary to activate micelle surfactants.
- show that the micelle surfactants can survive different environments
- Can be used for drug delivery in a human body with varying salinity

Results (pending)



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Resources

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