

Re: Shuttle lift-off questions

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- *From:* mmeron@xxxxxxxxxxxxxxxxxxxx
 - *Date:* Fri, 07 Jul 2006 23:17:24 GMT
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In article <44aed1e4.970809816@xxxxxxxxxxxxxxxxxxxx>, kmuldrezw@xxxxxxxxxxxxx (Ken Muldrew) writes:

mmeron@xxxxxxxxxxxxxxxxxxxx wrote:

In article <44aea1c4.958500411@xxxxxxxxxxxxxxxxxxxx>, kmuldrezw@xxxxxxxxxxxxx (Ken Muldrew) writes:

mmeron@xxxxxxxxxxxxxxxxxxxx wrote:

In article
<e81b1h\$8qk_001@xx>, jmfahciv@xxxxxxx writes:

Does this have anything to do with Ken's comment about biology is all about surfaces? I'm still thinking about that one.

This one is more complex. But, in a nut shell, biology is about structures in liquid. and stuff is happening on the surfaces of the structures. But it could've been a different liquid than water.

Just to push the "nut shell" analogy a bit further, because of the hydrogen bonding of water (which is also responsible for its freezing behavior), long chain aliphatic compounds (oils) are not soluble. But

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if you make a molecule with one part that hydrogen bonds and the other part a hydrocarbon tail, then you can make bilayer membranes. These are the structures that provide the surfaces for biology.

Now, what could play same role in a different working liquid (say, ammonia)?

Hmmm...ammonia has weaker hydrogen bonding than water so you might think that the same amphipathic molecules would work. But to form stable membranes and vesicles, it should take at least $10kT$ to disrupt the structures and I don't think ammonia will do it. I suppose the temperature could be lowered but then the oils become waxy and you lose the liquid properties that are necessary for movement within the membrane. If you shorten the aliphatic tails then they become more fluid but once again you lose stability by lessening the amount of solvent that is displaced by the oil-phase of the membrane.

Do you have something in mind?

Nothing special, really, I just recall some science fiction discussion from many years ago about possible alternatives to water based life and I remember ammonia being mentioned. But the details are very hazy by now.

Mati Meron | "When you argue with a fool,
meron@xxxxxxxxxxxxxxxxxxx | chances are he is doing just the same"

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