

Bubbles on surfaces: diffusive growth & electrolysis

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Propositions

1. Ultrasound waves can be efficiently used to remove bubbles from surfaces. The question whether their application is energetically favourable remains unanswered and opens many doors for future research.
2. We can control the frequency of ultrasound waves so that we can continuously enhance the bubble growth rate. The resonant curves become crucial in the configuration of frequency chirps which excite the bubbles at different phases of their growth.
3. Micromachined pillars promote bubble release from reacting surfaces by means of localising the areas in which bubbles nucleate and grow.
4. The origin of gas depletion during a succession of single bubbles resides in the fact that bubbles extract gas from their surroundings as they grow. The transition to convections plays a relatively important role, since in that case bubbles absorb more gas than pure diffusion can counteract.
5. We can play with different design configurations of artificial pits on substrates to force bubble coalescence and induce thus an early detachment.
6. It seems reasonable to think that second non-linear terms in the air dynamics equations must encounter an optimal solution for a specific structure profile which performs adequately in the transonic domain.
7. Whereas in many aspects droplets and bubbles behave in a remarkably similar manner, there is one spicy ingredient that makes the experimental bubble scientist suffer a living nightmare: buoyancy.
8. Even though technology is meant to ease our lives, people often tend to use it in the wrong way. It is very interesting to see how something called ‘social’ media can turn a person into an ‘asocial’ individual.
9. I would definitely recommend to any person facing a challenging experiment to remember Albert Einstein when he claimed that ‘If we knew what we were doing, it wouldn’t be called research.’
10. Antonio Gala, the famous Spanish writer, made the truest statement ever said in history: ‘Lo malo no es que los sevillanos piensen que tienen la ciudad más bonita del mundo... Lo peor es que puede que tengan hasta razón.’ (The worst thing is not that Sevillians think that they come from the best city in the world... The worst is that they may be right.)