Audible Sonochemistry

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Abstract:

Audible sound finds multiple applications in our daily life. However, in a laboratory, it has not yet established itself as an effective tool for regulating chemical reactions or processes. Sonochemical reactions typically take place in the presence of intense ultrasound. However, in these circumstances, an entirely distinct cavitation mechanism that involves the local creation of extremely high temperatures and pressures in solution is at work. Comparatively, the energy of audible sound is insufficient to affect any typical chemical process or reaction, at least not those that require the formation or breaking of a chemical bond. We will discuss about 'Audible Sonochemistry' in this talk, which is the use of audible sound to control out-of-equilibrium chemical reactions to produce programmable spatiotemporal patterns,[1] segregation of chiral supramolecular polymers,[2] enzyme cascade reactions for region-specific cell growth,[3] complex mechanical functions,[4] etc. (**Figure 1**). We have been able to establish a novel approach for chemists to handle functional supramolecular systems, by a special combination of physical phenomena including Faraday instability, Marangoni effect, and chemical systems that function out-of-equilibrium.

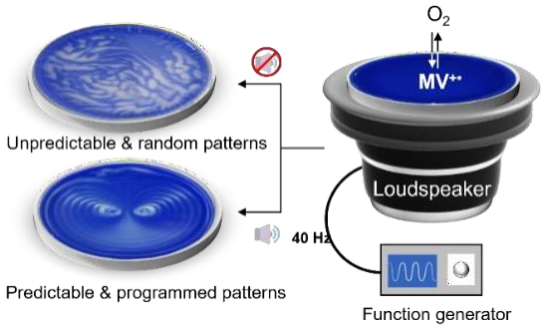

Figure 1 Schematic representation of 'Audible Sonochemistry' experimental set up.

References

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