

# Environmental Science journals

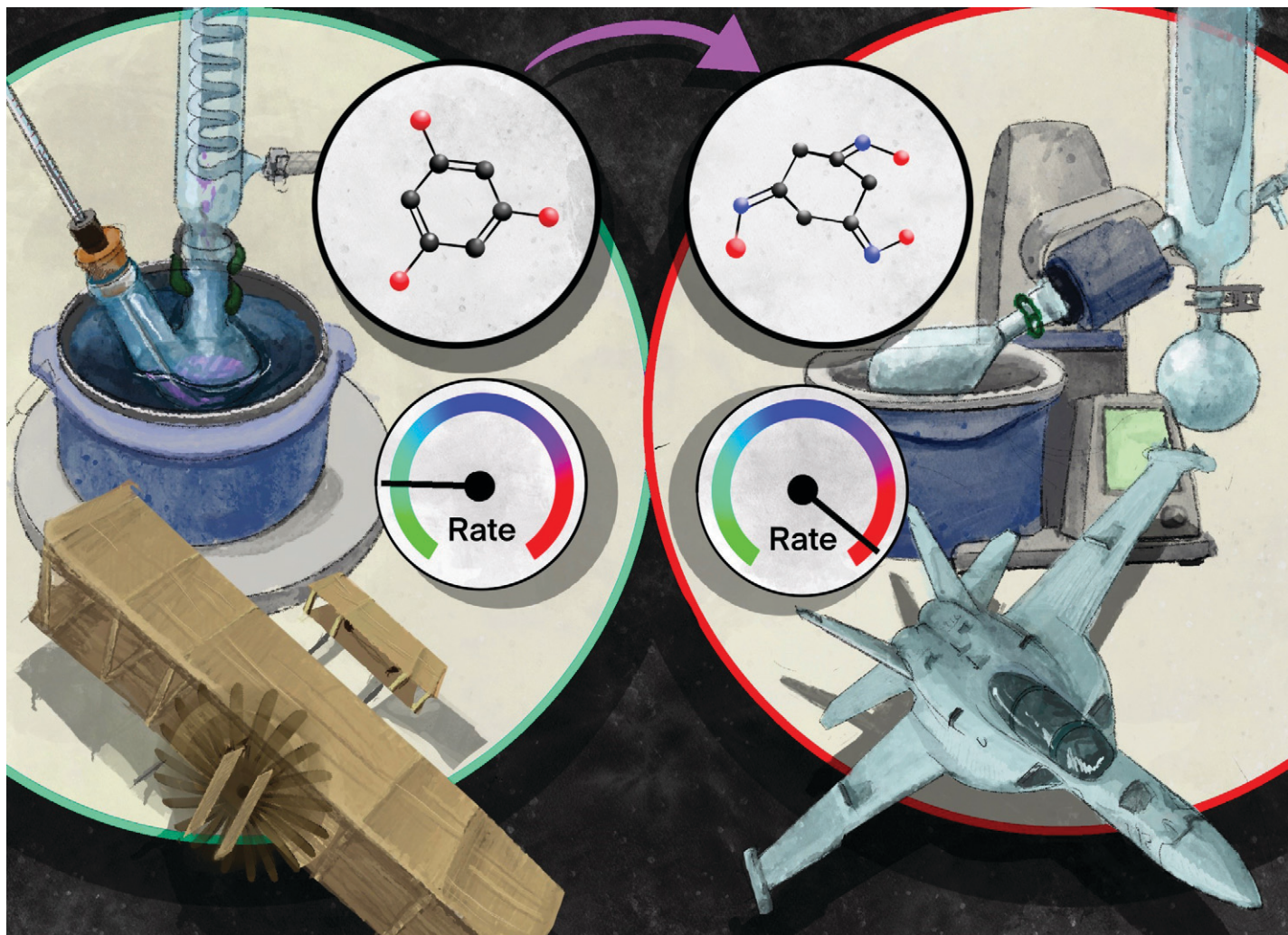
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Fundamental questions  
Elemental answers





**Showcasing research from Dr. Fedick's laboratory,  
Chemistry Division, Naval Air Warfare Center Weapons  
Division, China Lake, CA, United State of America.**

Accelerated formation of trioximes through confined  
volume reactors and scale-up using thin film methods

Confined volume systems such as microdroplets, Leidenfrost droplets, or thin films can accelerate reactions compared to traditional synthetic techniques. The oximation of phloroglucinol with hydroxylamine to form cyclohexane-1,3,5-trione trioxime, the precursor to 1,3,5-trinitrobenzene, was explored by seven confined volume systems. Each system accelerated the formation of cyclohexane-1,3,5-trione trioxime with thin films achieving the highest acceleration factor. To scale-up thin films, methods based on a rotary evaporator and electrospinning were explored. The rotary evaporator method produced cyclohexane-1,3,5-trione trioxime in ~5 minutes, compared to the legacy synthesis method that requires ~3 hours.

### As featured in:



See Patrick W. Fedick *et al.*,  
*React. Chem. Eng.*, 2023, **8**, 1576.