Microwave-Assisted Synthesis - A Tutorial

Jolly Beach Resort Antigua 31st January 2009 14:00 – 19:00

Instructors: Prof. C. Oliver Kappe and Dr. Doris Dallinger
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1. Introduction – Background
Why microwave-assisted chemistry - From defrosting foodstuff to chemical and industrial applications

2. General References
Books - review articles - feature articles - online resources

3. Microwave Theory
The electromagnetic spectrum - microwave dielectric heating mechanisms - dielectric properties penetration depth - material-wave interactions - loss tangents – solvents

4. Equipment Review
Multimode vs. monomode cavities - commercially available microwave reactors - general features instrument market survey

5. Microwave Effects
Temperature measurements under microwave irradiation - how does microwave heating accelerate reactions

6. General Processing Techniques
Solvent-free protocols - chemistry on MW transparent or absorbing inorganic supports phase transfer catalysis – open versus closed vessels - pre-pressurized reaction vessels - chemistry in ionic liquids and hot water - passive heating elements

7. MedChem/HTS Processing Techniques
Parallel vs. automated sequential processing - supported reagents and solid-phase synthesis - time savings with microwaves - drug discovery examples

8. Scale-up Technology
Scale-up in batch, continuous flow or stop flow mode - the numbering up approach - scale-up equipment - production scale - microreactor and microcapillary approaches - on-line reaction monitoring

9. Practical Tips and Safety Aspects
Relating oil bath to microwave chemistry - reaction optimization - general tips - ACS publication guidelines reaction databases - contract synthesis - safety: the do's and don'ts in microwave chemistry

10. Outlook
Emerging applications - the future of microwave chemistry

11. Q & A Session

$300 All-inclusive: Course notes – Accommodation – Meals – Refreshments

Zing