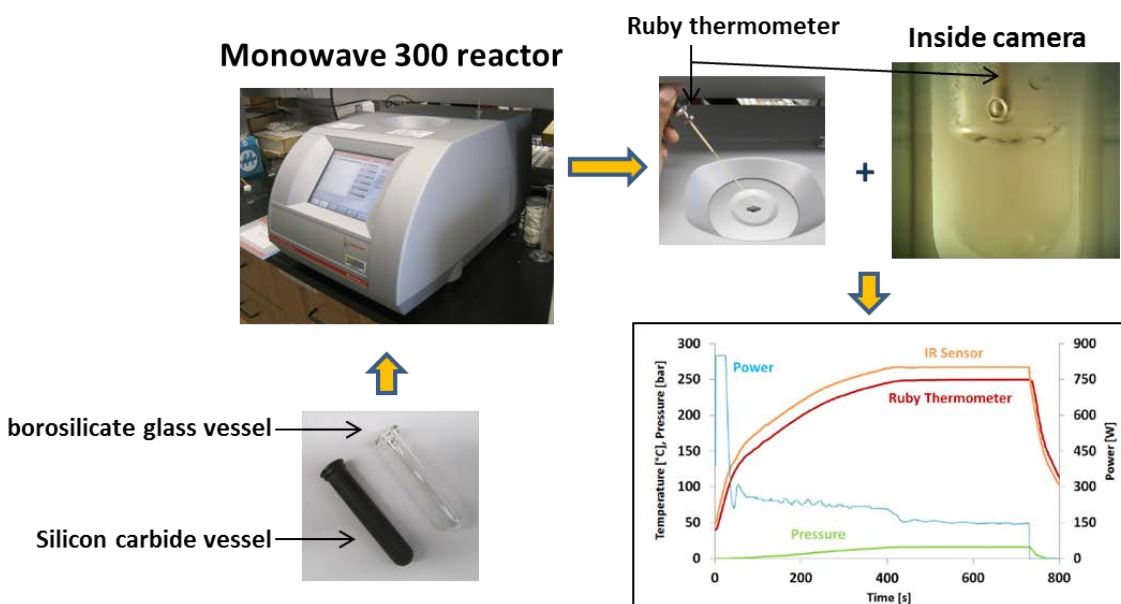


CPAS Focus on Technology: Microwave assisted synthesis and extraction

Instrument: Anton-Paar Monowave 300 Reactor

The Anton Paar Monowave 300 is a high performance microwave reactor used for small scale microwave synthesis. With a maximum power of 850W, the Monowave 300 is suitable for non-polar solvent and anhydrous synthesis. With microwave energy, heating solvents in contact with a sample to partition analytes from the sample matrix into the solvent for extraction. The vessels used are borosilicate glass rated to resist to a pressure up to 30 bars and a temperature up to 300°C with a volume range 0.5-20 mL.

Accurate measurement of the reaction temperature is made using a fiber optic "ruby thermometer" placed inside the vessel. To study the "microwave effect" the Monowave 300 also uses the Anton-Paar silicon carbide vessel which absorbs the microwave and thus allows only heat to provide the reaction. A camera is also installed inside the chamber to observe the change during the reaction (precipitation, dissolution, changes in coloration).



Selected References and Information

1. Microwave chemistry in silicon carbide reaction vials: separating thermal from nonthermal effects. Obermayer D, Gutmann B, Kappe CO. *Angew Chem Int Ed Engl* 48:8321-4 (2009).
2. Investigation of the formation of CuINS2 nanoparticles by the oleylamine route: comparison of microwave-assisted and conventional syntheses. Pein A, Baghbanzadeh M, Rath T, Haas W, Maier E, Amenitsch H, Hofer F, Kappe CO, Trimmel G. *Inorg Chem* 50:193-200 (2011).
3. Impact of Eutectic Solvents Utilization in the Microwave Assisted Extraction of Proanthocyanidins from Grape Pomace. Neto RT, Santos SAO, Oliveira J, Silvestre AJD, *Molecules* 27: 246-261 (2022).

For more information on instrument specification and availability, please contact:

Laurent Calcul, Ph.D. - CPAS Director, CAS / calcul@usf.edu