

*High Pressurized Microwave Digestion: A New Vessel Technology to suit New Methodologies*

T.Restivo, D.Barclay, E.Hasty, Mike Barnard

Pressurized microwave dissolution has become widely accepted as a rapid and convenient method of sample preparation. However, digestion of organic or carbon based compounds can be prone to problems. Longer carbon chains are more stable and thus it can be difficult to predict the pressure generating behaviour of each of a range of samples and control them as a single batch. The inclusion of an inorganic (or 'un'organic) blank within each batch can also cause problems. Samples run together must behave in a similar absorptive manner when microwaved. Control of this batch process has traditionally been accomplished by the use of a single reference vessel acting as a representative of the entire batch. Recently more modern control algorithms function by adjusting or spreading the control to each member of the batch as their critical digestion reaction processes begin. This paper describes the development of a novel microwave pressure digestion vessel specifically for organic sample types which generate high pressures at lower temperatures. A novel control mechanism will also be presented which is a radical departure from traditional ramping style control and which could greatly improve safety and control for this process.

Results will be presented from the dissolution of longer chain stable hydrocarbons such as oils and plastics as well as more straightforward plant and animal tissue materials. A significant improvement in ease of use, overall safety and quality of resultant solution will be demonstrated over existing pressure vessel technology.

Tina Restivo  
CEM Corporation  
Matthews, NC, USA  
Email: [Tina.Restivo@CEM.com](mailto:Tina.Restivo@CEM.com)