

**MICROWAVE INDUCED PLASMA (MIP) AS A POLLUTION ABATEMENT
TECHNOLOGY: COMPARISON OF TRICHLOROETHENE DISSOCIATION BY THERMAL
MIP, NON-THERMAL MIP AND THERMAL PROPANE FLAME**

E.R. Binner, R.T. Deam

Industrial Institute of Swinburne, Swinburne University of Technology, Melbourne, Australia

This paper describes experiments and chemical modelling undertaken to investigate the dissociation of chlorinated organic solvents (trichloroethene in particular) with microwave plasma and compare it with thermal combustion in a propane flame. It was possible to generate both thermal and non-thermal plasmas in the plasma rig by varying the flow rate or incident power. Therefore, a three-way comparison was possible: trichloroethene combustion by thermal plasma, non-thermal plasma and propane-fuelled flame. Experimentation has revealed that these experiments are difficult to carry out and careful chemical analysis is essential. Results suggest that release of trichloroethene directly to the environment may have less negative impact on the environment than conventional or plasma combustion. This is because chlorinated aromatics seem to be formed at lower temperatures than would be expected from equilibrium modelling. Some of the aliphatics formed are also more environmentally harmful and/or more damaging to health than trichloroethene. This work is relevant to the industrial cleaning industry because microwave plasma, if chemically feasible, would be a cheap solution to impending regulations. It is relevant to the research community as it highlights the importance of careful chemical analysis when designing environmental treatment technologies.