

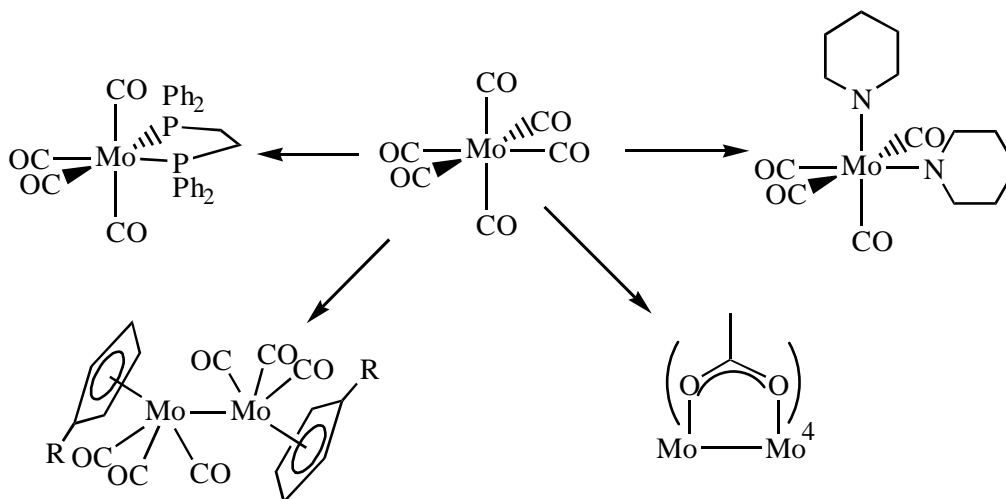
## MICROWAVE CHEMISTRY IN THE UNDERGRADUATE LABORATORY: ORGANOMETALLIC CHEMISTRY

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A simple microwave oven has been modified for use in an undergraduate (UG) laboratory [1]. This cuts reaction times of thermal reactions which would otherwise be precluded from a UG laboratory on the grounds of time and safety and allows the simple preparation of a wide range of otherwise inaccessible compounds. We have focused most of our attention on organometallic complexes. A range of microwave-enhanced reactions of group 6 metal carbonyls is presented that are suitable for use in an undergraduate laboratory [2]. Mo(CO)<sub>6</sub> is particularly well suited to this procedure, with reactions generally proceeding cleanly and without need for an inert atmosphere. Key examples include the high yield syntheses of *cis*-[Mo(CO)<sub>4</sub>(pip)<sub>2</sub>], *cis*-[Mo(CO)<sub>4</sub>(diphosphine)] (diphosphine = dpmm, dppe), [(η<sup>5</sup>-RC<sub>5</sub>H<sub>4</sub>)Mo(CO)<sub>3</sub>]<sub>2</sub> (R = H, Me) and [Mo<sub>2</sub>(μ-O<sub>2</sub>CMe)<sub>4</sub>]. Reactions of chromium and tungsten hexacarbonyls are less impressive, nevertheless, [Cr(CO)<sub>5</sub>Cl][NEt<sub>4</sub>], [(η<sup>6</sup>-C<sub>6</sub>H<sub>5</sub>OMe)Cr(CO)<sub>3</sub>] and *cis*-[W(CO)<sub>4</sub>(pip)<sub>2</sub>] have all been prepared *via* this method.



### References

- [1] Microwave-Assisted Reflux in Organometallic Chemistry: Synthesis and Structural Determination of Molybdenum Carbonyl Complexes, G.Hogarth, M.Ardon and P.D.Hayes, *J. Chem. Educ.*, 2002, **79**, 1249 - 1251.
- [2] Organometallic chemistry in a conventional microwave oven: The facile synthesis of group 6 carbonyl complexes, M.Ardon, G.Hogarth and D.T.W.Oscroft, *J. Organomet. Chem.*, 2004, **689**, 2429 – 2435.