



UNIVERSITY OF LEEDS

This is a repository copy of *Adsorption coupled photocatalytic degradation of dichlorvos using LaNiMnO₆ perovskite nanoparticles supported on polypropylene filter cloth and carboxymethyl cellulose microspheres.*

White Rose Research Online URL for this paper:
<https://eprints.whiterose.ac.uk/180883/>

Version: Accepted Version

Article:

K, S, Das, D and Das, N (2017) Adsorption coupled photocatalytic degradation of dichlorvos using LaNiMnO₆ perovskite nanoparticles supported on polypropylene filter cloth and carboxymethyl cellulose microspheres. *Environmental Progress & Sustainable Energy*, 36 (1). pp. 180-191. ISSN 1944-7442

<https://doi.org/10.1002/ep.12494>

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



eprints@whiterose.ac.uk
<https://eprints.whiterose.ac.uk/>

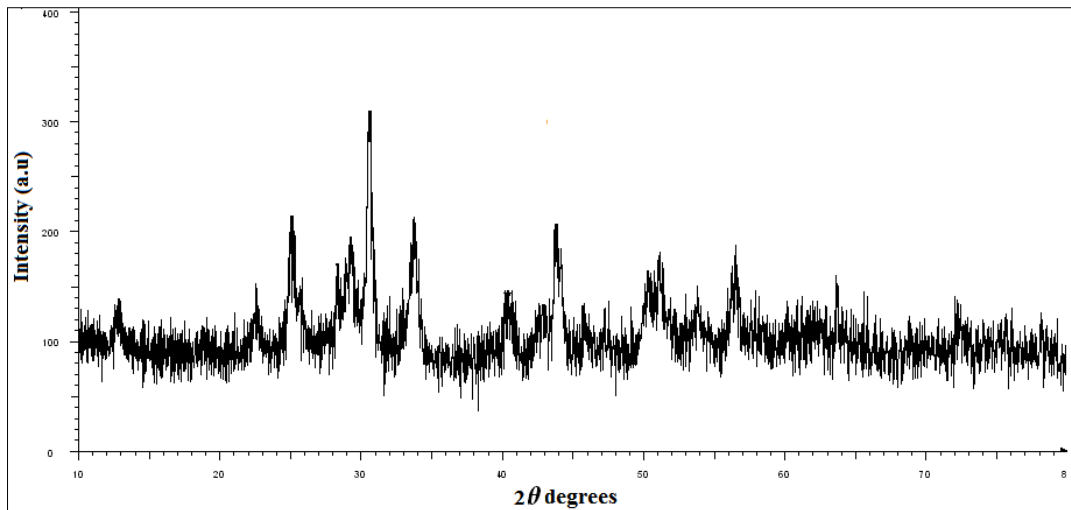


Fig. 1. XRD pattern of LaNiMnO_6 perovskite nanoparticles

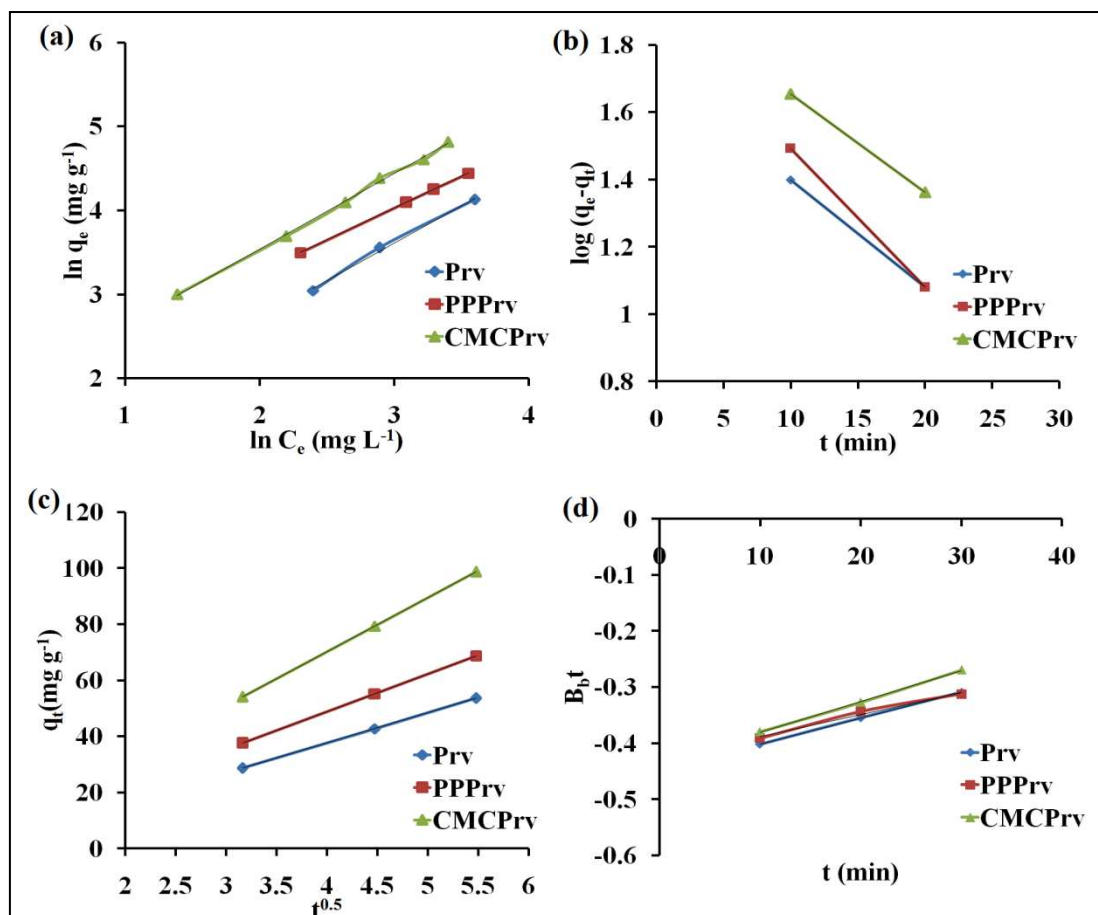


Fig. 2. (a) Freundlich isotherm (b) Pseudo-first order (c) Intraparticle diffusion and (d) Boyd plot of dichlorvos adsorption onto Prv, PPPrv and CMCPrv.

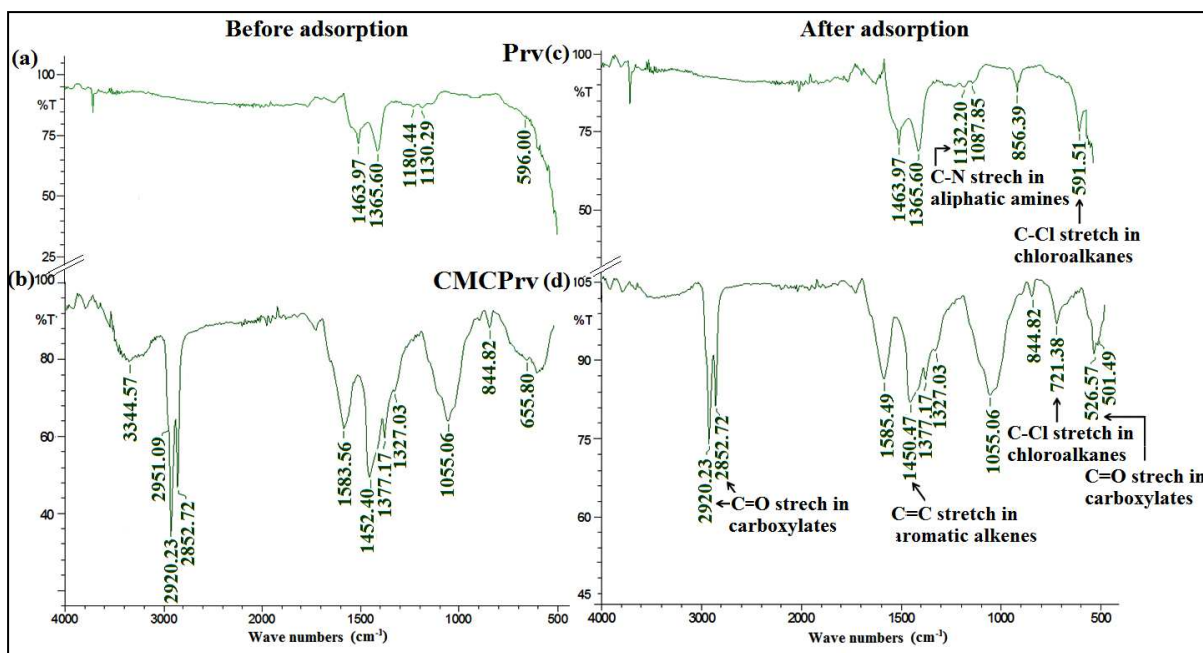


Fig. 3. FT-IR spectra of Prv and CMCPrv before (a, b) and after (c, d) DCV adsorption

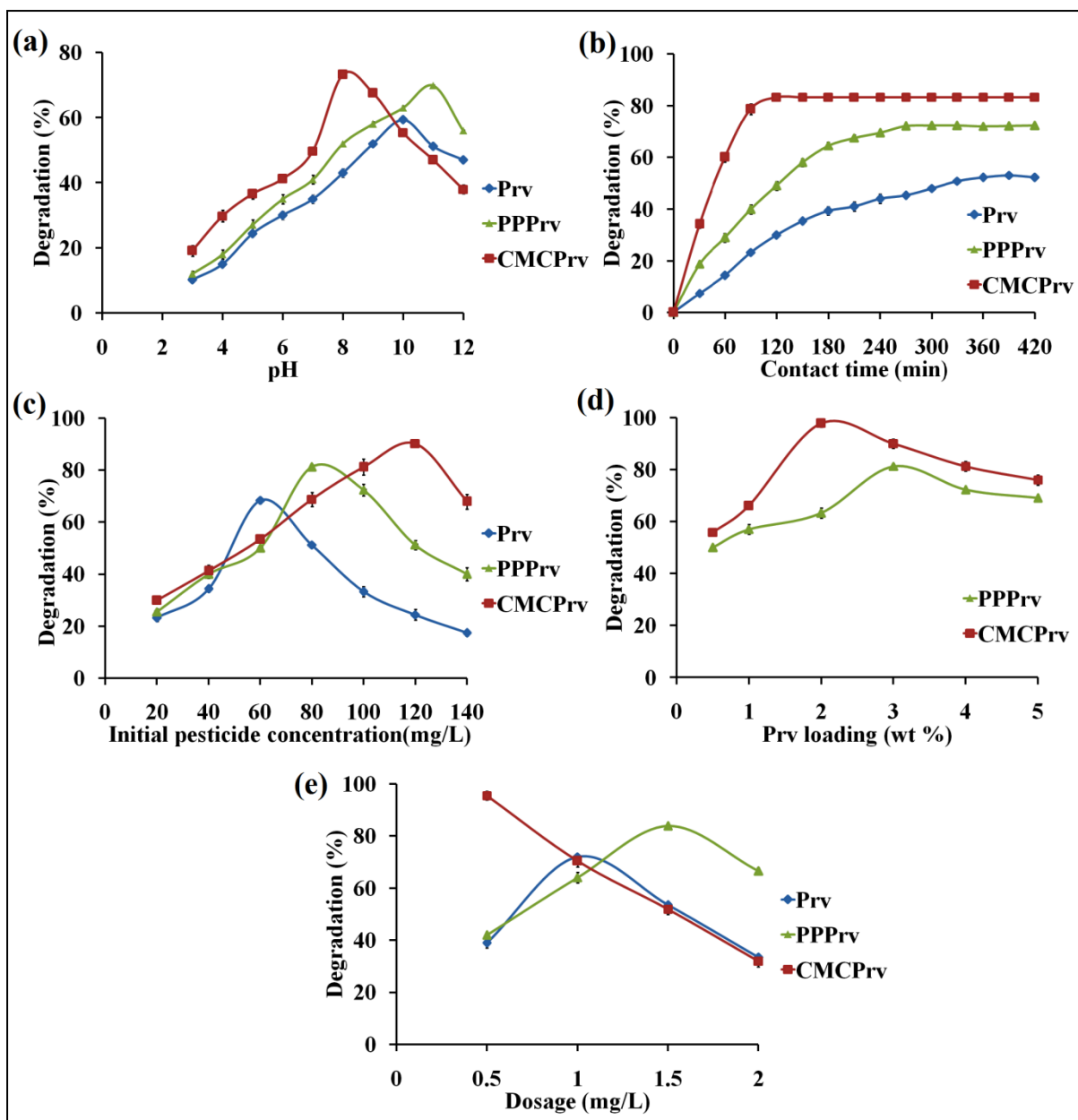


Fig. 4. Effect of parameters on degradation of DCV by Prv, PPPrv and CMCPrv. (a) pH (b) irradiation time (c) initial DCV concentration (d) Prv loading and (e) catalyst dosage

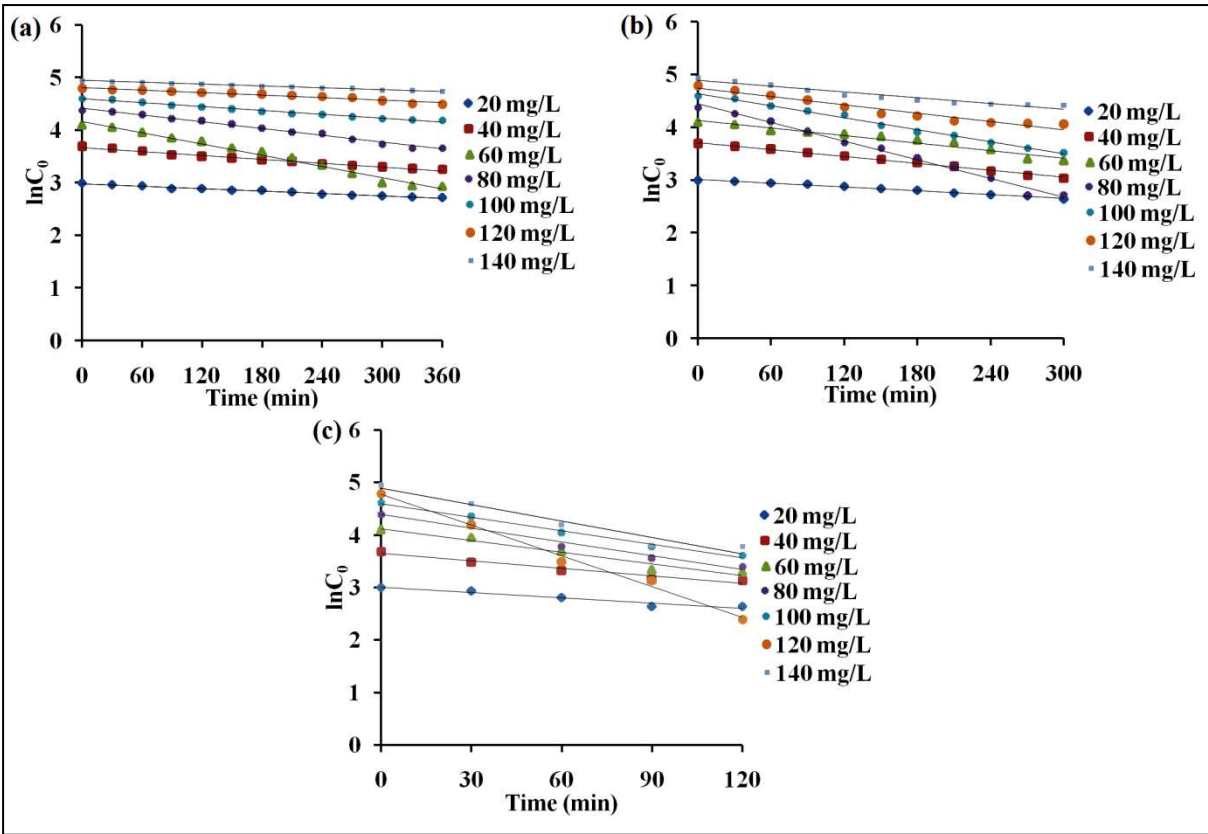


Fig. 5. First-order kinetics for various initial DCV concentrations by (a) Prv, (b) PPPrv and (c) CMCPrv.

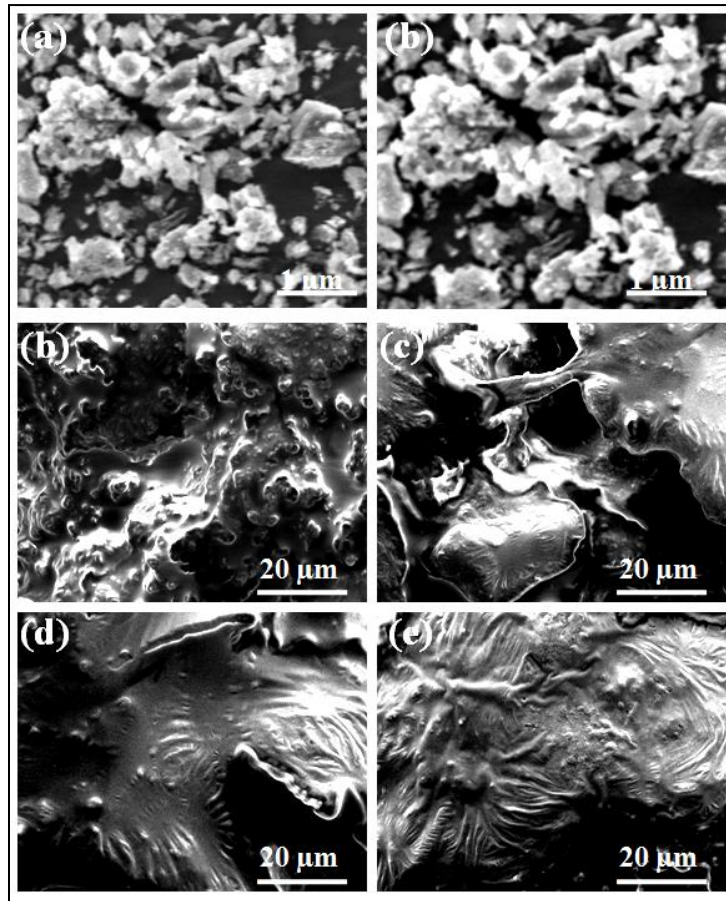


Fig. 6. Surface morphology of Prv (a) before adsorption, and (b) after adsorption and the surface changes of CMCPrv at various intervals of time during DCV degradation (c) 0th min (d) 30th min (e) 60th min and (f) 120th min

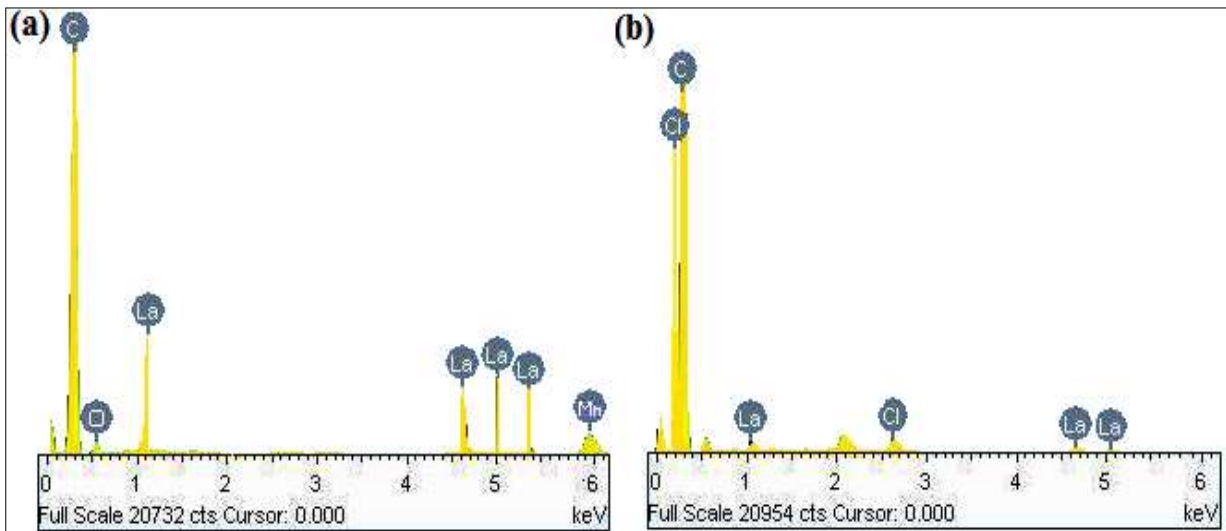


Fig. 7. EDX spectra of CMCPrv before and after DCV degradation

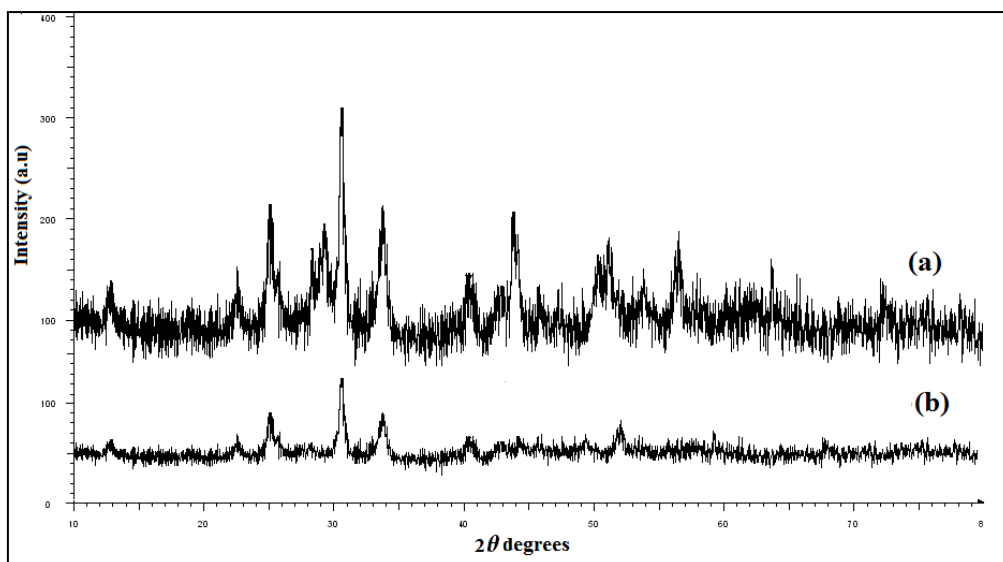


Fig. 8. XRD patterns of Prv nanoparticles (a) Before and (b) After degradation of DCV

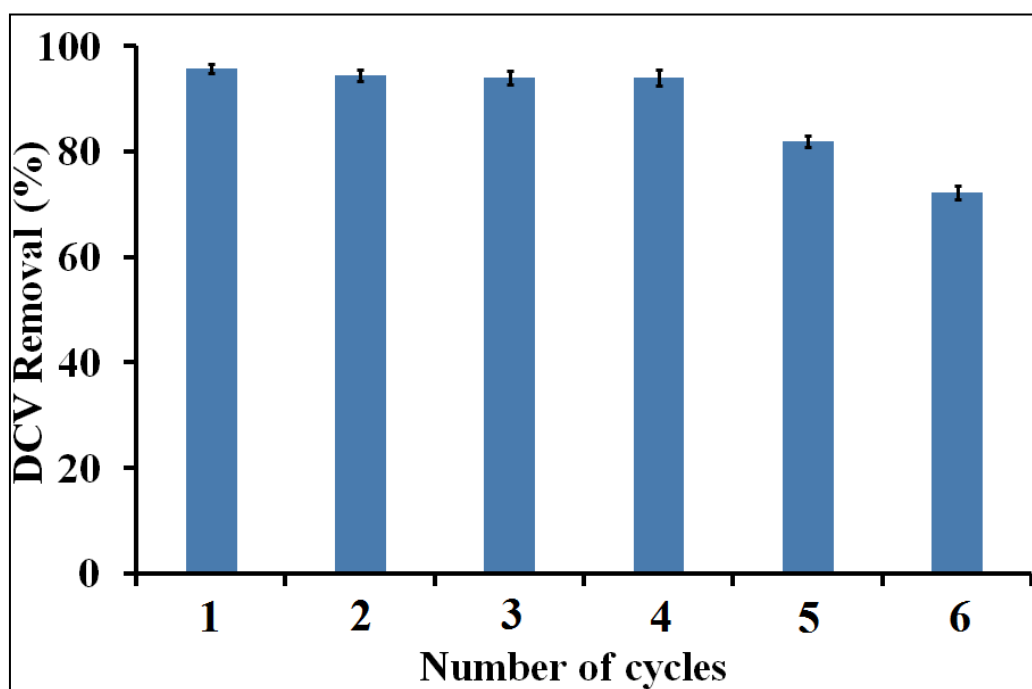


Fig. 9. DCV degradation degree as a function of the number of cycles for CMCPv

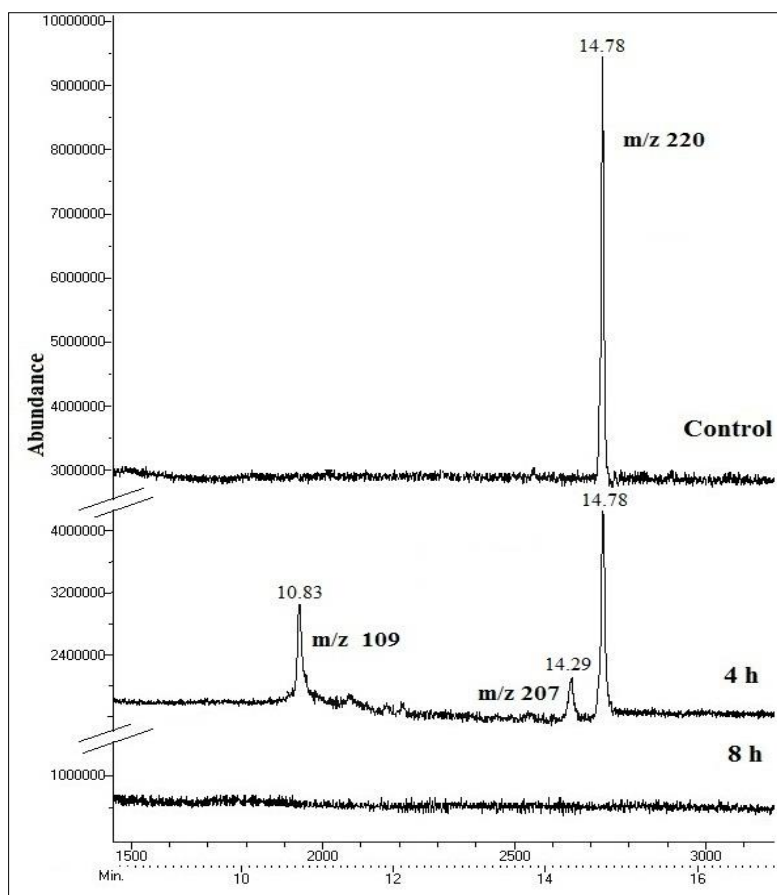


Fig. 10. GC-MS analysis of DCV photocatalytic degradation at various time intervals

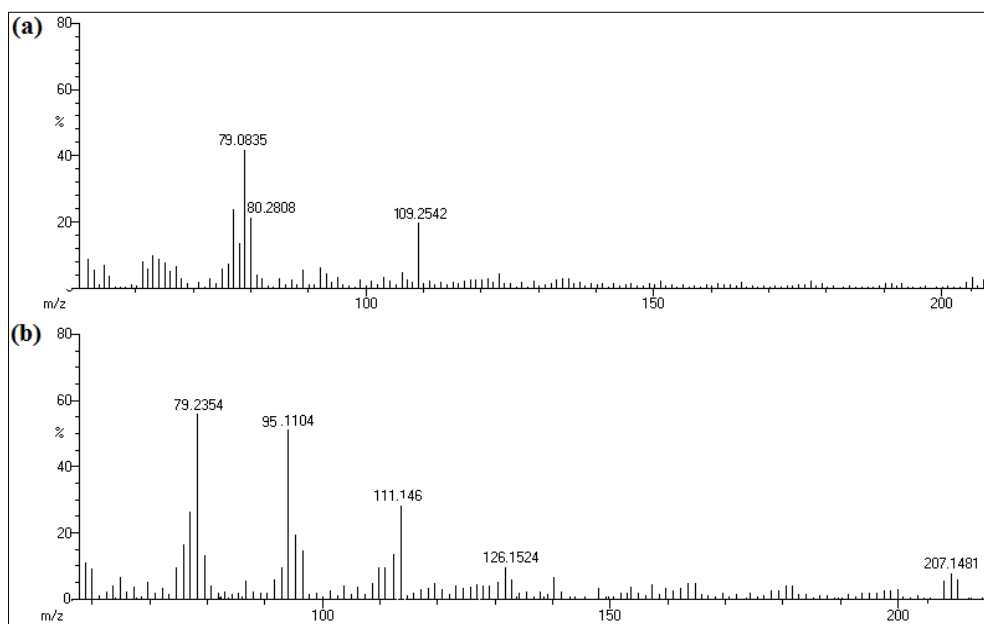


Fig. 11. Mass spectra of DCV intermediates formed during the photocatalytic degradation.
 (a) O,O-dimethyl phosphoric ester (b) Desmethyl dichlorvos