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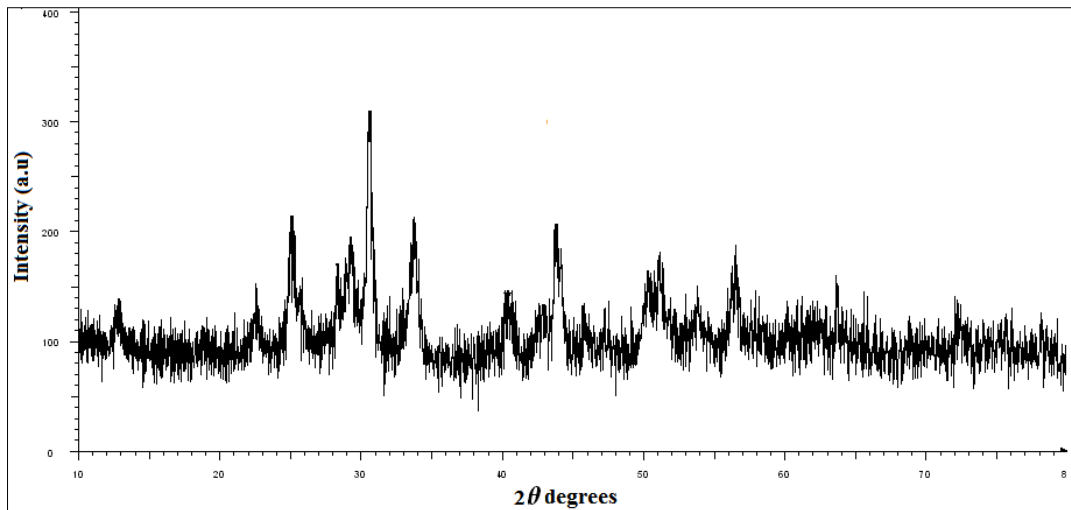
https://doi.org/10.1002/ep.12494

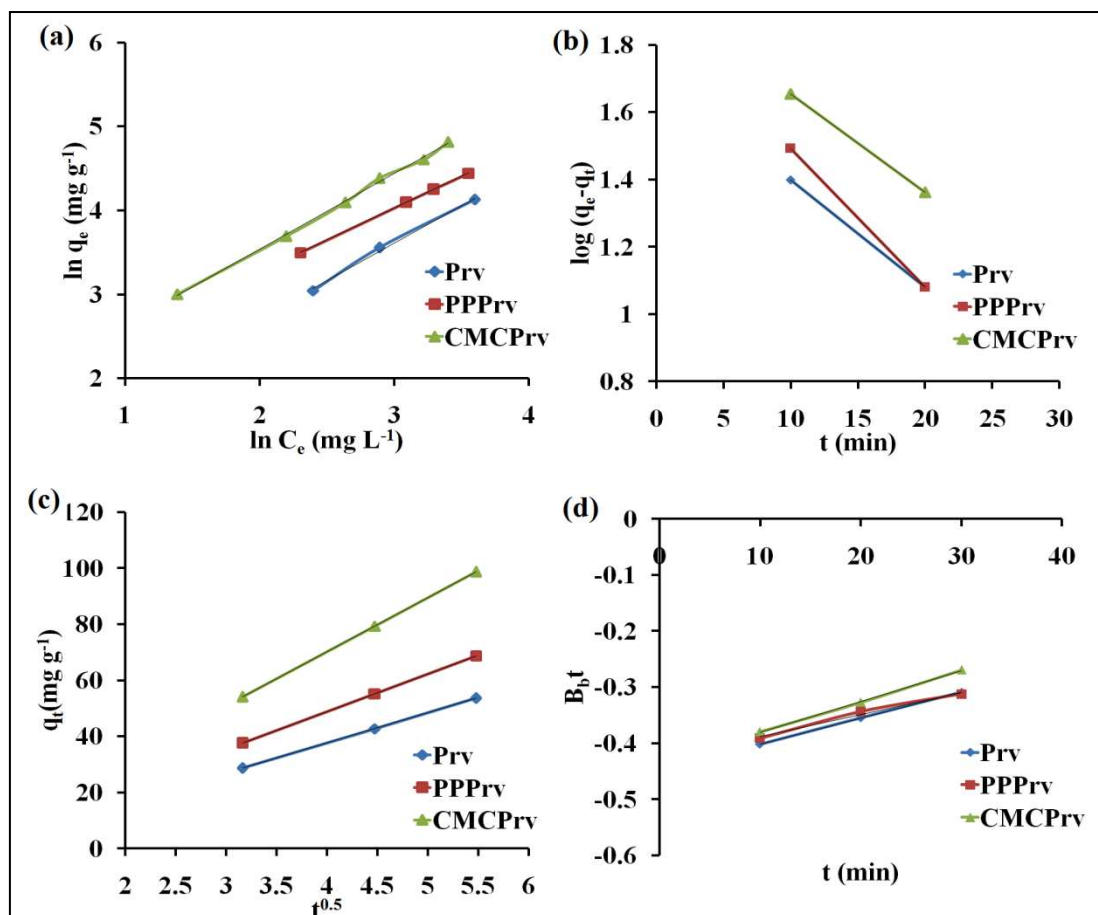Fig. 1. XRD pattern of LaNiMnO$_6$ perovskite nanoparticles

Fig. 2. (a) Freundlich isotherm (b) Pseudo-first order (c) Intraparticle diffusion and (d) Boyd plot of dichlorvos adsorption onto Prv, PPPrv and CMCPrv.
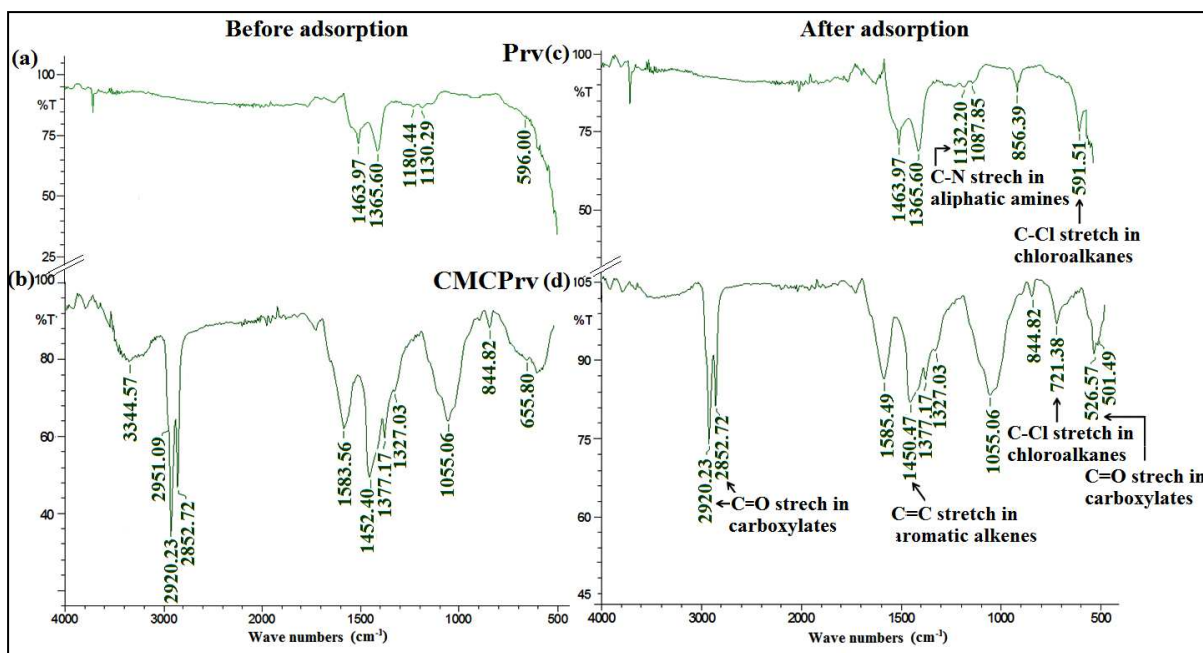
Fig. 3. FT-IR spectra of Prv and CMCPrv before (a, b) and after (c, d) DCV adsorption
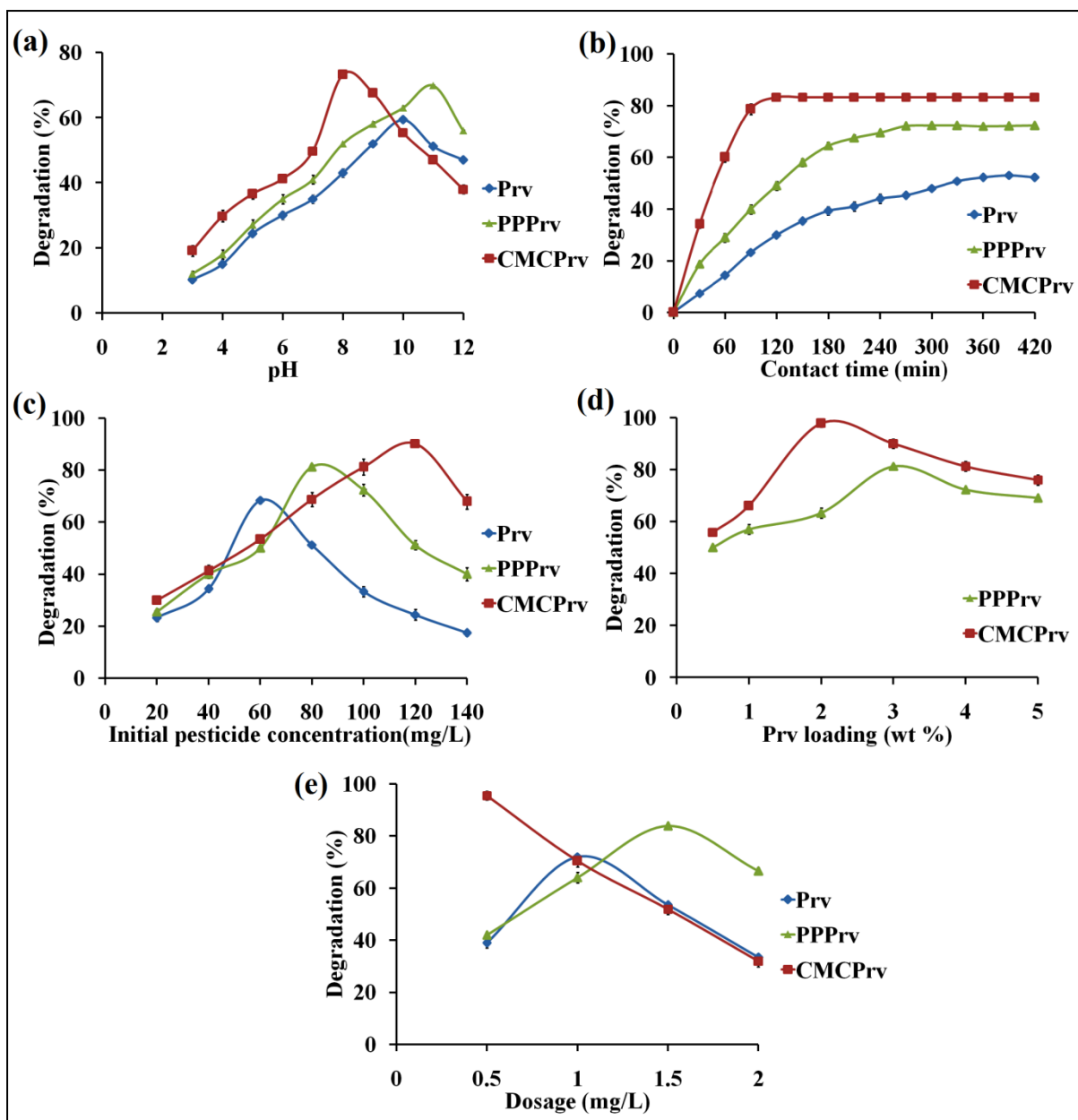
Fig. 4. Effect of parameters on degradation of DCV by Prv, PPPrv and CMCPrv. (a) pH (b) irradiation time (c) initial DCV concentration (d) Prv loading and (e) catalyst dosage
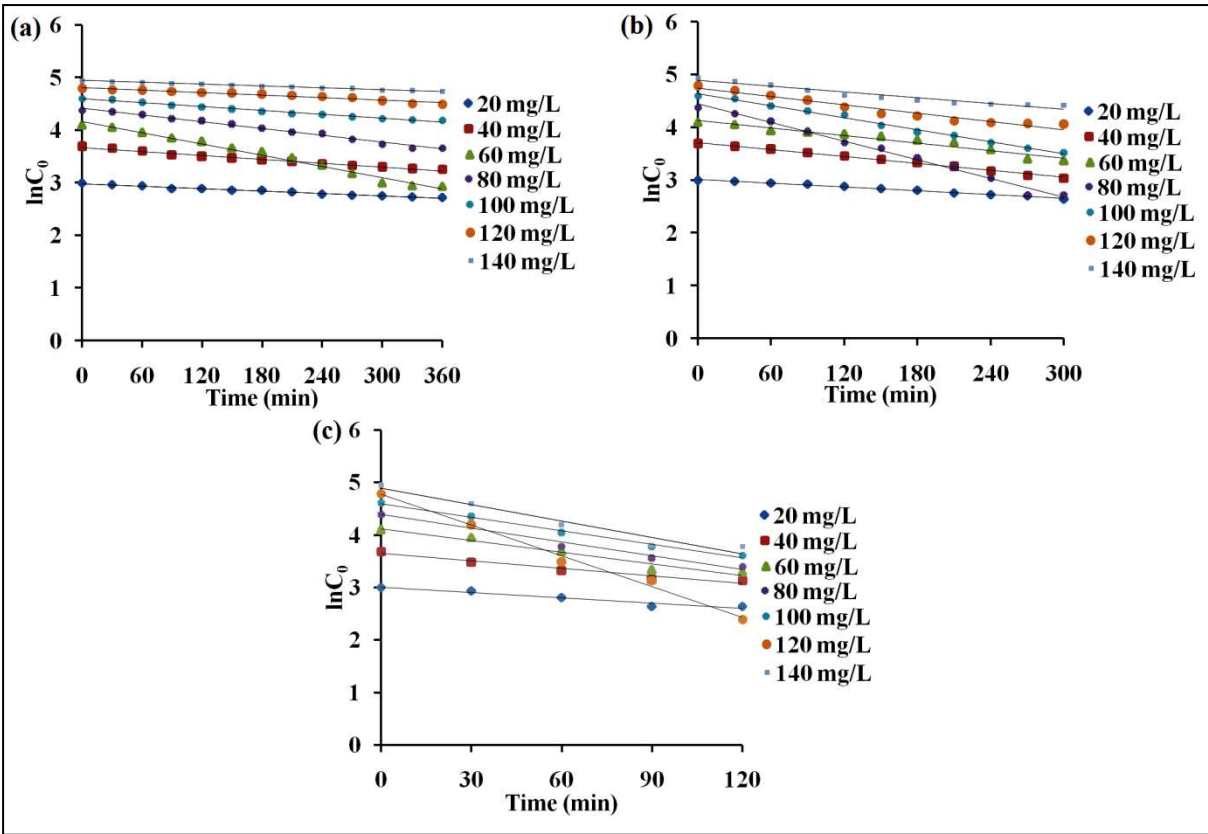
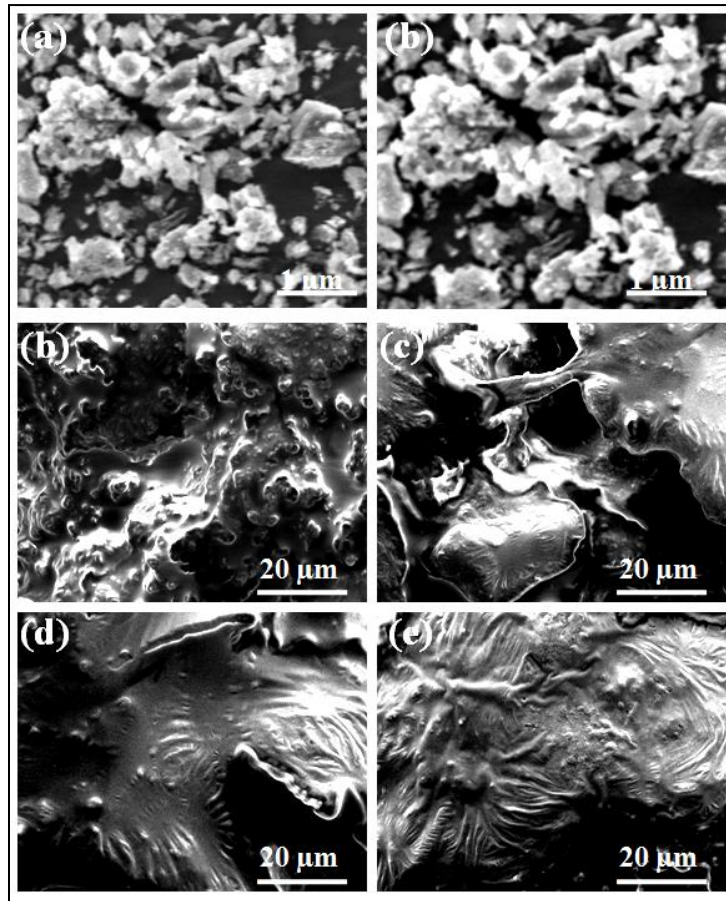Fig. 5. First-order kinetics for various initial DCV concentrations by (a) Prv, (b) PPPrv and (c) CMCPrv.

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
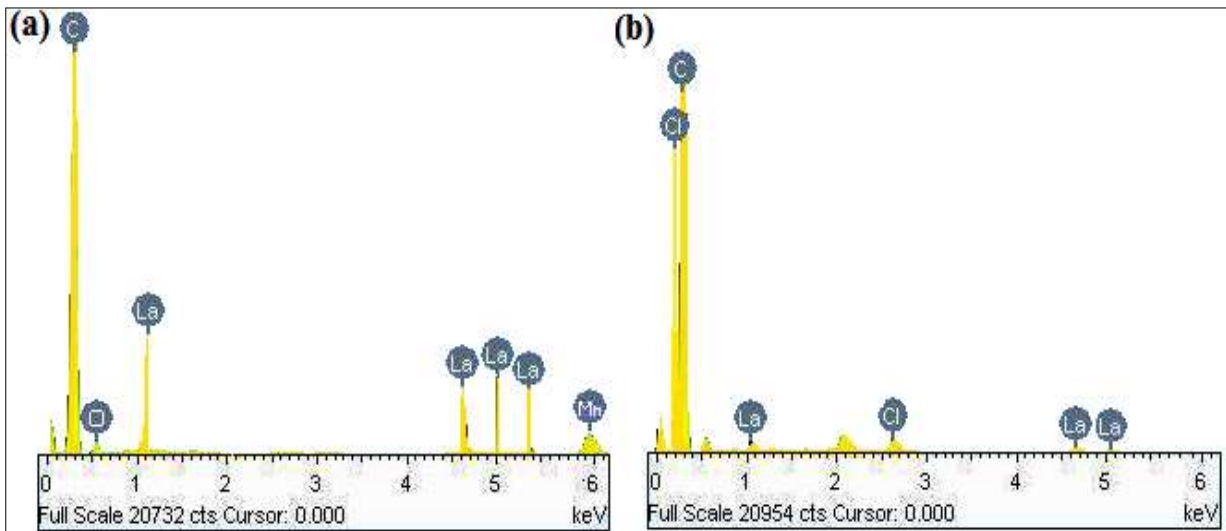

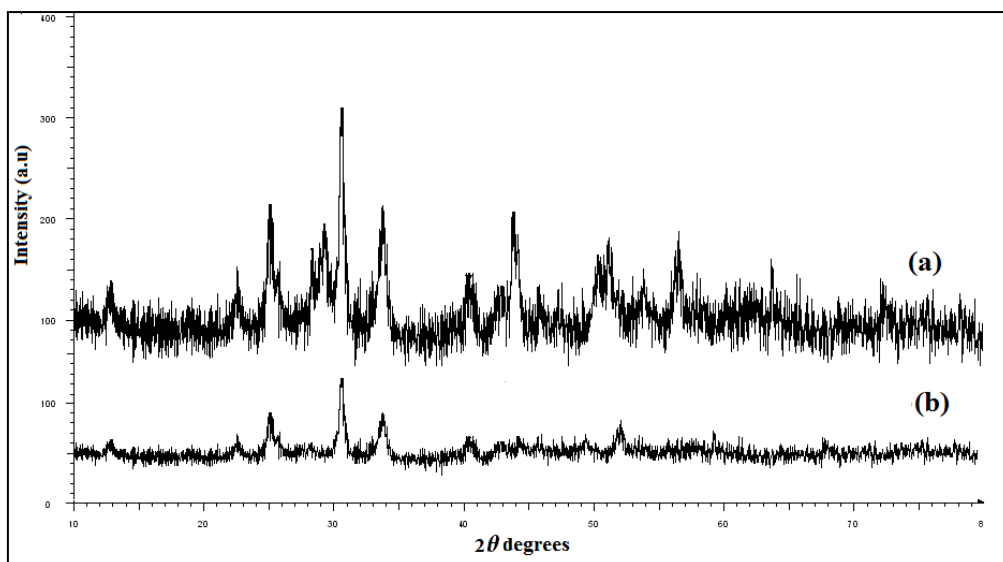Fig. 7. EDX spectra of CMCPrv before and after DCV degradation

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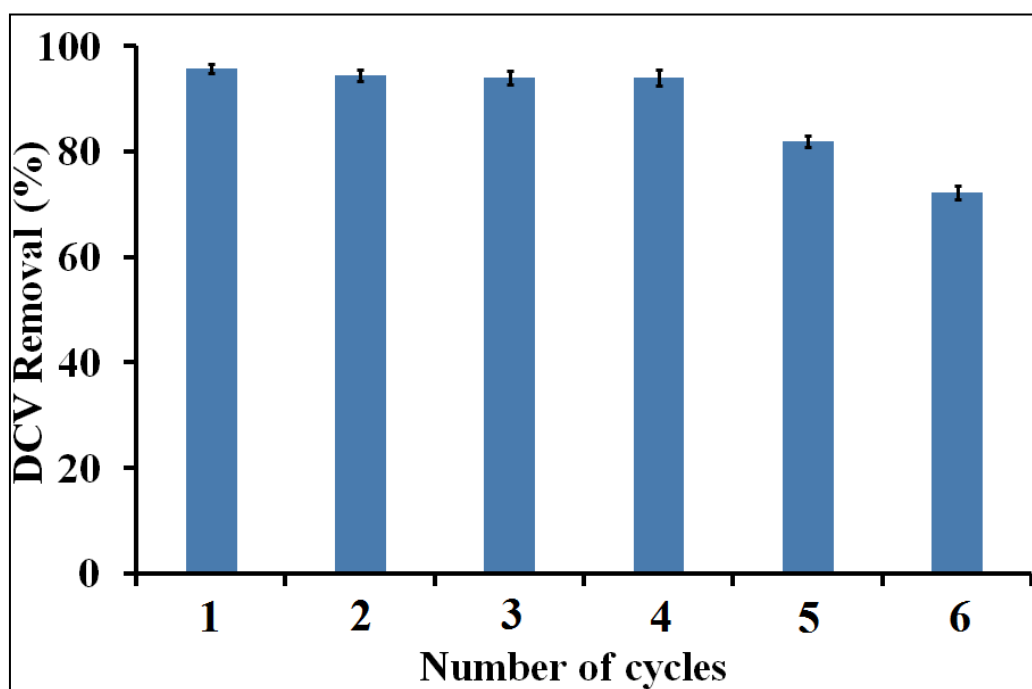

Fig. 9. DCV degradation degree as a function of the number of cycles for CMCPrv

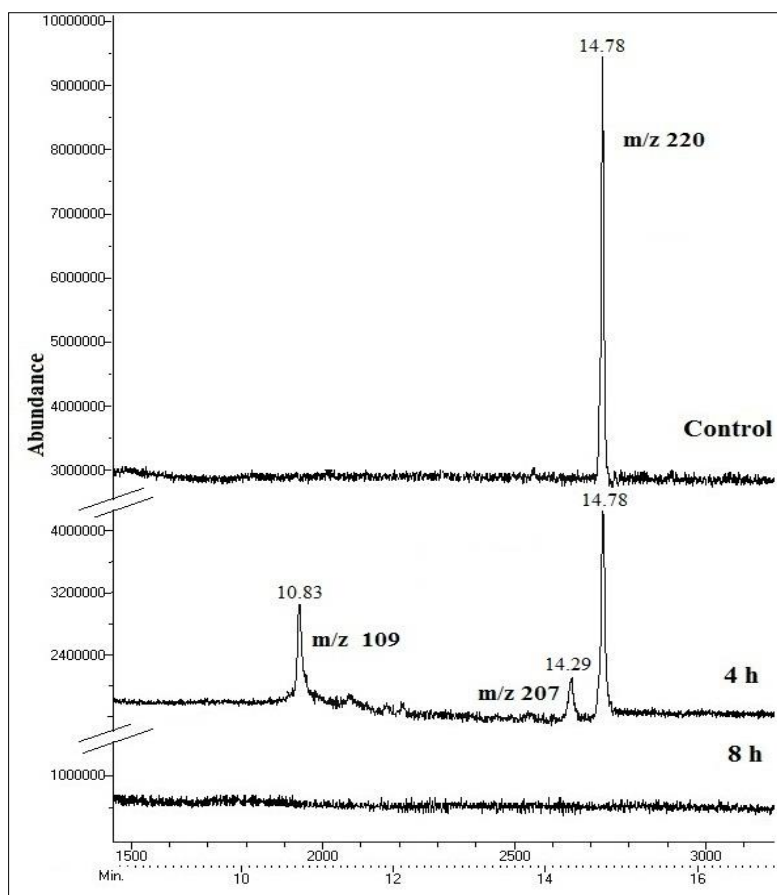Fig. 10. GC-MS analysis of DCV photocatalytic degradation at various time intervals
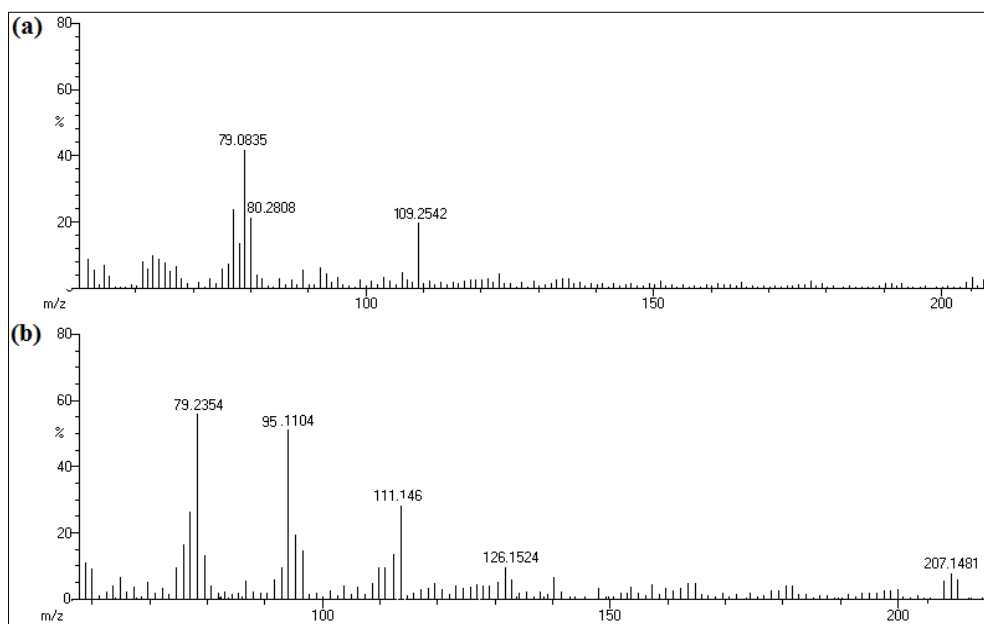

Fig. 11.Mass spectra of DCV intermediates formed during the photocatalytic degradation.
(a) O,O-dimethyl phosphoric ester (b) Desmethyl dichlorvos