Characterisation of graphite fibre anode used for organic pollutants removal from aqueous media

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Abstract

Organic pollutants are very common in surface water, originating from various industries. In order to mitigate the pollution of waters, the treatment of plants' effluents must be performed by a suitable and effective method. The destruction of organic pollutants can be removed from aqueous media by advanced oxidation[1,2] and electrochemical advanced oxidation processes[3,4]. This can be achieved using an electrolytic reactor with a set of proper electrodes. In this work electrodes used for the electrochemical degradation of pollutants - be it a dye or pesticide – were both graphite fibre. It is not common for the carbonaceous materials to be used as anodes because of the fairly fragile nature of carbon towards the voltage. Nonetheless, it was found in this study that it can be used several times for organics degradation. During each degradation trial graphite fibre anode was damaged, this was studied by scanning electron microscopy (SEM). Carbon leached into the solution in a range of nanoparticles, discovered by dynamic light scattering (DLS) and SEM. The organics were effectively removed from the synthetic polluted solutions by the Carbon fibre / Carbon fibre electrolytic cell.

References

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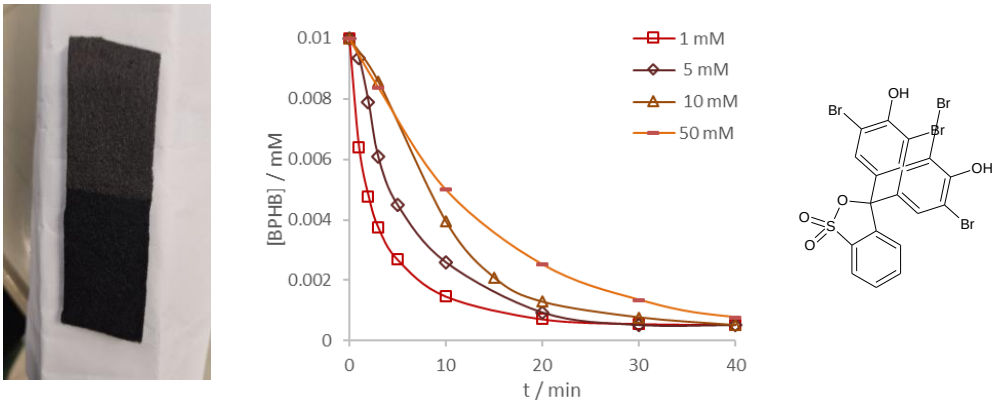

Figure 1: Graphite fibre anode and the degradation of bromophenol blue. [BPB] decrease during anodic oxidation at different Na_2SO_4 concentrations. Electrolytic cell Cf/Cf, V = 150 ml, i = 25 mA, pH = 5.7.