Abstract

In the present work, the triangular tungsten clusters \{[W_3O_2(O_2CCH_3)_6](H_2O)_3\}(CF_3SO_3)_2 and \{[W_3O_2(O_2CCH_2CH_3)_6](H_2O)_3\}(BF_4)_2*5H_2O were dissolved in both hydrophobic and hydrophilic ionic liquids (ILs) and subjected to a cathodic potential of roughly 2V. It was proposed that successful deposition of these metal clusters on a platinum electrode would yield Pt-supported anodic catalysts which could be used in ethanol fuel cells (EFCs). Visual examination of the electrode surfaces indicated that a film had been deposited, however, the surface with W_3(CF_3SO_3)_2 quickly oxidized when removed from the IL. Therefore, SEM imaging and EDX analysis of the W_3(BF_4)_2 surface were performed. The data indicated that the film was composed mainly of carbon, oxygen, nitrogen, iron and fluorine with very little tungsten contribution. Electronic spectra taken pre- and post-deposition suggest that structural changes to the W_3O_2 unit occurred with the disintegration of the triangular geometry being a thermodynamically favored route.