Electronic Supplementary Material (ESI) for Journal of Materials Chemistry

Supporting Information

Details of UV/Ozone treatment: In the UV/Ozone treatment, ozone, an active oxidizing agent, is generated in situ from atmospheric oxygen by exposure to 185 nm UV light. The ozone produced subsequently photo dissociates into molecular oxygen and atomic oxygen upon exposure to 254 nm light. The latter specie reacts with the polymer to form free radicals and activated species that eventually remove organic portions of the polymer in the form of carbon dioxide, water, and a small amount of volatile organic compounds.

Stability of the samples calcined at lower temperatures in ambient:

It is observed that the Ce^{+3} concentration decreases with the calcination temperature. Calcination at 200^0C causes limited oxidation and also calcinations at 400^0C retains a significant Ce^{3+} component. It was also observed that the samples were stable for extended periods of weeks in ambient. Fig. 1a and b shows the high resolution Ce 3d and photoluminescence spectra of the samples calcined at 200^0C and 400^0C and further sustained for 30 days in ambient. The spectra strongly suggest that the samples were reasonably stable at ambient atmosphere.

Fig.1: (a) XPS Ce 3d and (b) photoluminescence spectra of the samples calcined at 200^0C and 400^0C and further sustained for 30 days in ambient.