Textural/structural characterisics and reducibility of Pt supported on Si-Ce mixed oxides

황경란[1,2], 박종수[1,*], 임선기[2]
[1]한국에너지기술연구원; [2]한국과학기술원
(deodor@kier.re.kr*)

The textural/structural characteristics, the reducibility of Si-modified Pt/CeO2 catalysts are investigated by X-ray powder diffraction (XRD), Raman spectra, temperature programmed reduction (H2-TPR), X-ray photoelectron spectroscopy (XPS) for the application of water-gas shift reaction. On the basis of results of XRD, Raman spectra and XPS, Si-modified ceria has a smaller average crystallite size than pure ceria and a great deal of oxygen vacancies in the support which is directly related to the presence of Ce^{+3}. The creation of oxygen defects by doping Si to ceria may offer excellent potential for increasing hydroxyl group on the surface of ceria and resulting in enhanced reducibility and consequently increased concentration of surface formate species, an intermediate for WGS reaction, as shown in the results of H2-TPR and DRIFTS.