

Fig S1 TGA curve of (a) LPW and (b) LPW<sub>2</sub>/ZrO<sub>2</sub>

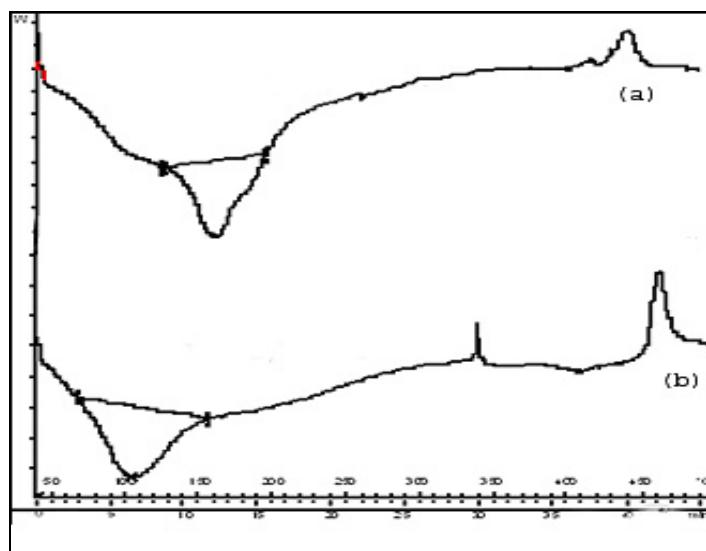


Fig S2 DSC curve of (a) LPW and (b) LPW<sub>2</sub>/ZrO<sub>2</sub>

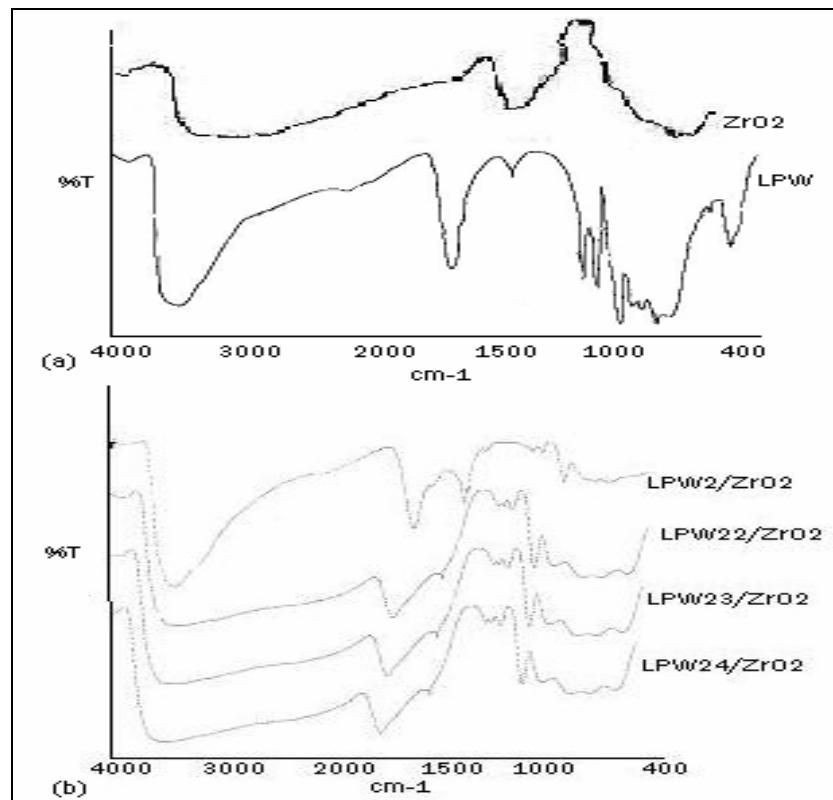


Fig S3 FT-IR spectra of (a)  $\text{ZrO}_2$  and LPW (b) LPW<sub>2</sub>/ZrO<sub>2</sub>, LPW<sub>22</sub>/ZrO<sub>2</sub>, LPW<sub>23</sub>/ZrO<sub>2</sub> and LPW<sub>24</sub>/ZrO<sub>2</sub>

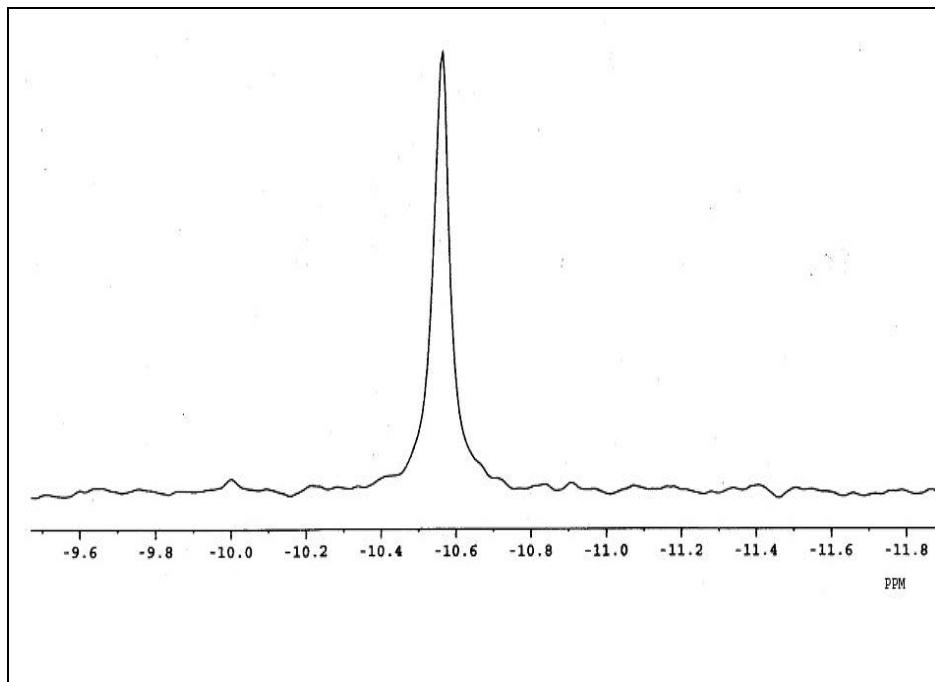


Fig S4  $^{31}\text{P}$  solution NMR of LPW

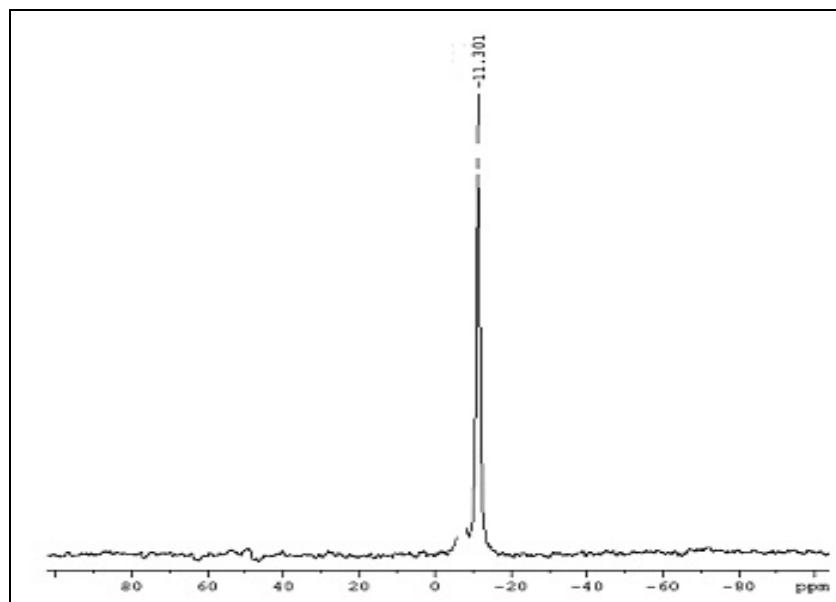


Fig S5 (a)  $^{31}\text{P}$  MAS NMR of LPW

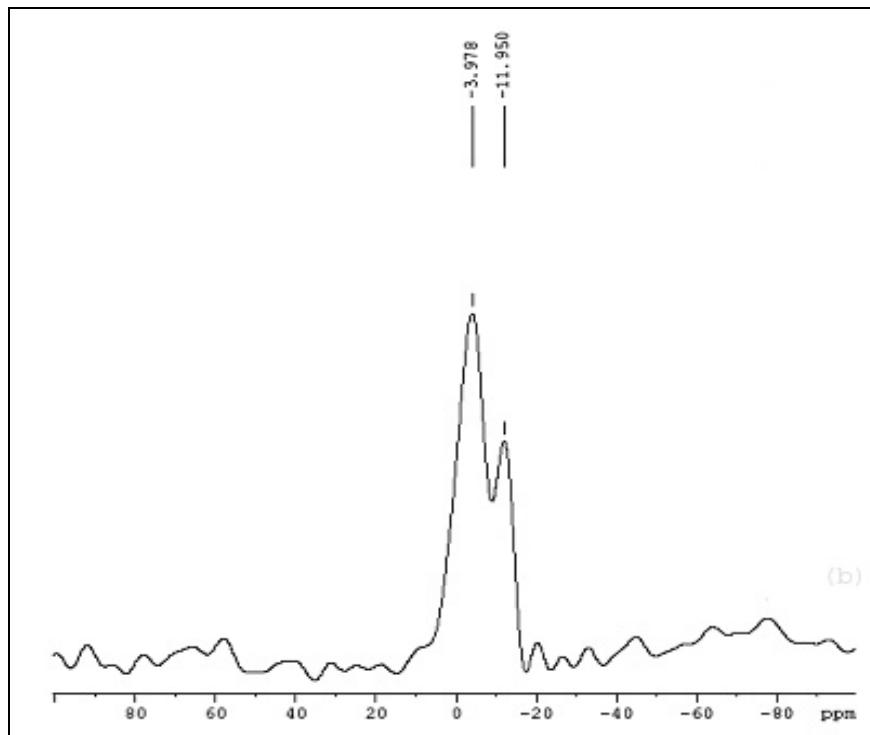


Fig S5 (b)  $^{31}\text{P}$  MAS NMR of  $\text{LPW}_2/\text{ZrO}_2$

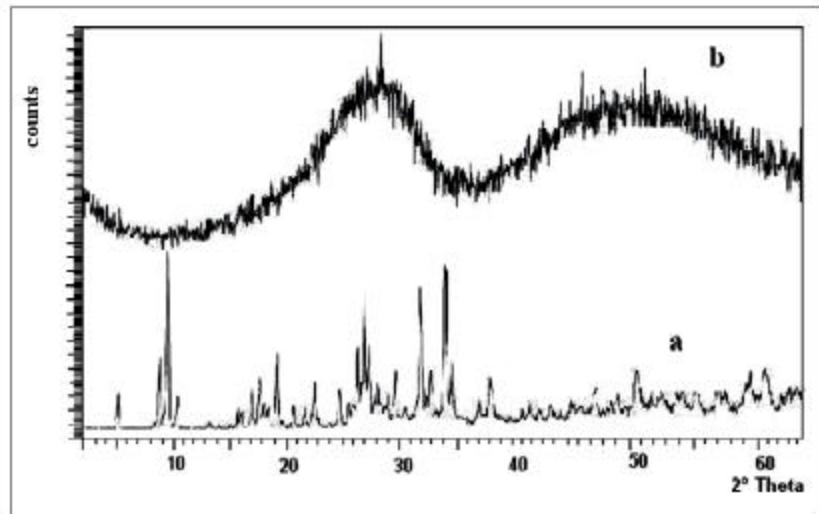


Fig. S6 XRD diffraction pattern of (a) LPW (b) LPW<sub>2</sub>/ZrO<sub>2</sub>