



centered at  $1.99\text{\AA}$  (corrected), a value near to that of CoO, while the second maximum at the F.T. almost disappear, indicating that this Co(II) phase is well dispersed over the zirconia surface. As shown by the XANES and EXAFS region, the treatment at  $500^\circ\text{C}$  in hydrogen reduces the cobalt to the metallic state (Co-Co distance at  $2.42\text{\AA}$ ). Finally, as indicated by the XANES spectrum, the oxidation treatment at  $500^\circ\text{C}$  restore the spinel structure, but according with the low intensity of the second maximum in the F.T. of the EXAFS spectrum, this spinel phase is better dispersed over the support surface that this phase was in the original sample. These results can be better understanding after a similar reduction experiment accomplished by Temperature Programmed Reduction (TPR) (Figure 3), where it can be identified three principal peaks. The first one at  $135^\circ\text{C}$ , has been assigned to surface reduction of spinel phase. The peak at  $315^\circ\text{C}$ , according to the previous results obtained by XAS, to the reduction of the massive spinel to a Co(II) dispersed phase, and finally, the peak at  $450^\circ\text{C}$  to a reduction process giving metallic cobalt as product. In a second TPR experiment after reoxidation of the sample (not shown), the peak at  $315^\circ\text{C}$  almost completely disappears, emerging a new one at  $360^\circ\text{C}$ , assigned to the reduction of the new dispersed spinel phase detected by XAS.

## REFERENCES

1. H-K.Lin, H-C. Chiu, H-C. Tsai, S-H. Chien, C-B. Wang; *Catálisis Letters*, 88, 2003 169-174.
2. M.D.Fokema, J.Y.Ying; *Catalysis Review*, 43, 1-29 (2001).
3. A.Yu.Khodakov, J.Lynch, D.Bazin, B.Rebours, N.Zanier, B.Moison, P.Chaumette; *Journal of Catalysis*, 168, 16-25 (1997).

