

### Sonochemical syntheses of cauliflower-like nano-structure $\text{Bi}_2\text{CuO}_4$

Z. Shobeiri\*, M. Pourayoubi

Department of Chemistry, Ferdowsi University of Mashhad, Mashhad, Iran

The logical design and controlled synthesis of metal oxides nanoparticles has been of interest in modern chemical engineering because of their fascinating structural diversities. Nano-sized version of a metal oxide leads to a better availability and to a more effective application. Up to the present, Bi(III)-containing compounds, like  $\text{BiVO}_4$ ,  $\text{Bi}_2\text{WO}_6$  and  $\text{Bi}_2\text{MoO}_6$ , have been reported to be promising photocatalysts under visible light irradiation [1]. Moreover,  $\text{Bi}_2\text{CuO}_4$  is a kind of antiferromagnetic substance, which also has been used as heterogeneous catalyst in oxidation [2].

The aim of the present work is synthesis of  $\text{Bi}_2\text{CuO}_4$  nano powder under ultrasound irradiation and characterize by IR, SEM, EDX, XRD and TGA. The SEM images of the prepared  $\text{Bi}_2\text{CuO}_4$ , showing cauliflower-like nano-structure, are given in Fig. 1 (a). The existence of bismuth, copper and oxygen was confirmed by SEM-EDX analysis (Fig. 1 (b)). The XRD pattern is recorded in the range of  $20^\circ$  to  $90^\circ$  for  $2\theta$ , (Fig. 1 (c)), and all the reflection peaks can be indexed as tetragonal  $\text{Bi}_2\text{CuO}_4$  (JCPDS File, No. 42-0334). The average particles size (D), of 33 nm, was calculated by using the Debye-Scherrer equation,  $D = 0.89\lambda/(\beta \cos \theta)$ , where  $\lambda$  is the wavelength of the radiation,  $\beta$  is the full-width at half-maximum and  $\theta$  is the diffraction angle.

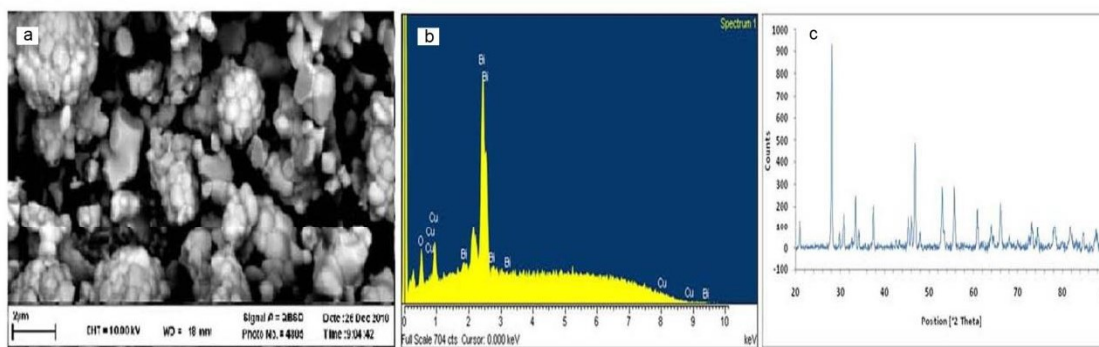


Fig. 1

#### References

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- [2] X.Y. Chen, C. Ma, X.X. Li, P. Chen, J.G. Fang, Catal. Commun. 10 (2009) 1020. P1105T7

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