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Structure Studies of $YBa_2Cu_3O_{7-\delta}$/Ag by XRD and SEM

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Abstract: The $YBa_2Cu_3O_{7-\delta}$ (YBCO) superconductor ceramic has low critical current density (J_c) because of weak links between its grains . There have been a lot of efforts to increase J_c. One of the methods to increase J_c is to dope YBCO with other materials such as silver (Ag). In this paper, the effect of adding silver to YBCO with the weight ratio of 0% , 10% ,15% , 20% and 30% on its microstructure have been investigated. The X-ray diffraction (XRD) and scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) diagrams of samples have been obtained and studied. The study of XRD patterns shows that Ag is appears as a separate phase in the samples and the position of YBCO peaks do not considerable changes. The study of SEM of samples reveals that the Ag added to YBCO does not present in its microstructure and does not change the lattice constants of YBCO by considerable amount, and also the Ag grains remain among YBCO grains and provide the better intergranular contact. The percentage of silver for optomizing the physical properties of YBCO superconductores is almost 20.