

International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI)

Balapur P.O., Hyderabad – 500005, Telangana, India



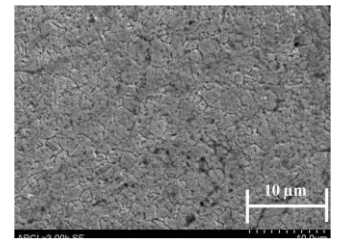
Cu-Cr-CNT Composite for Electrical Contact Applications

Overview

Copper based alloys being used currently for electrical contactors have lower electrical conductivity due to the presence of alloying elements. Carbon nanotubes (CNTs) as reinforcements in Cu are used to improve the electrical conductivity without compromising on the strength. The performance of CNT/metal–matrix composites depends on proper dispersion of individual CNTs in the metallic matrix and effective interfacial bonding between CNTs and the matrix. Efforts have been made to successfully develop such composites by adopting a suitable processing technique and optimising the composition to meet the above requirements.

Key Features

- Improved hardness (150 BHN) at an acceptable electrical conductivity (60% IACS)
- Ability to process in the form of rod, wire and sheets



Microstructure of Cu-Cr/CNT composite

Potential Applications

- Current carrying conductors
- Spot welding electrodes
- Electrical contacts
- Friction parts

Material	Property	
	Electrical conductivity, % IACS	Hardness, HV _{0.05}
ETP Cu	95	60
Cu-CNT	44	87
Cu-Cr-CNT	67	110

Electrical and mechanical properties of various Cu, Cu-CNT and Cu-Cr-CNT

Intellectual Property Development Indices (IPDI)

- Coupon level testing was carried out

Status	1	2	3	4	5	6	7	8	9	10

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