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(54) **Title**: ARTICLES CONTAINING COPPER NANOPARTICLES AND METHODS FOR PRODUCTION AND USE THEREOF

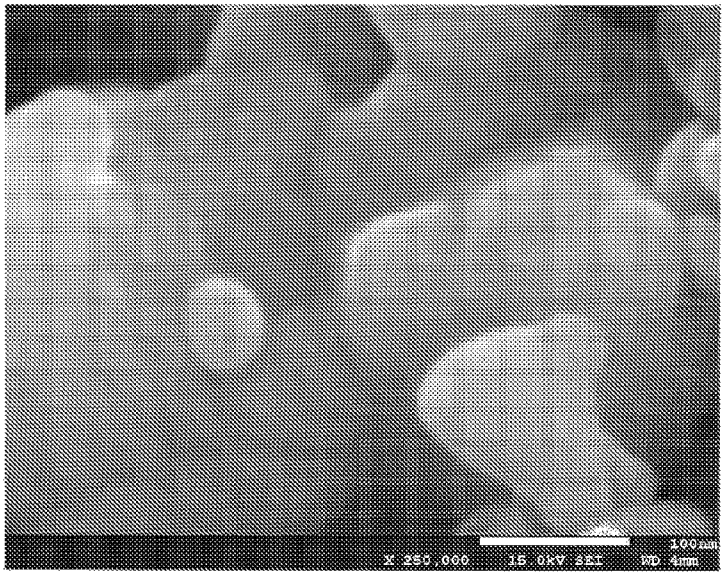

FIGURE 6

(57) **Abstract**: Articles containing a matrix material and plurality of copper nanoparticles in the matrix material that have been at least partially fused together are described. The copper nanoparticles are less than about 20 nm in size. Copper nanoparticles of this size become fused together at temperatures and pressures that are much lower than that of bulk copper. In general, the fusion temperatures decrease with increasing applied pressure and lowering of the size of the copper nanoparticles. The size of the copper nanoparticles can be varied by adjusting reaction conditions including, for example, surfactant systems, addition rates, and temperatures. Copper nanoparticles that have been at least partially fused together can form a thermally conductive percolation pathway in the matrix material.

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