CLAIMS

1. Copper fine particles,

wherein the copper fine particles have a coating film containing copper carbonate and cuprous oxide on at least a part of the surface thereof, and

a ratio between the following Db and the following Dv (Db/Dv) is in a range of 0.50 ~ 0.90,

Dv: an average value (nm) of the area equivalent circle diameter of the copper fine particles obtained by acquiring SEM images for 500 or more copper fine particles using a scanning electron microscope, and calculating by image analysis software,

Db: a particle size (nm) of the copper fine particles obtained by measuring a specific surface area (SSA (m2/g)) of the copper fine particles using a specific surface area meter, and calculating by the following formula (1),

$$Db = 6 / (SSA \times \rho) \times 109 \ldots (1)$$

in the formula (1), ρ is a density of copper (g/m3).

2. The copper fine particles according to Claim 1,

wherein the Dv is in a range of 50 ~ 500 nm.

3. The copper fine particles according to Claim 1 or 2,

wherein the Db is in a range of 25 ~ 500 nm.

4. A conductive material,

wherein the conductive material contains the copper fine particles according to any one of Claims 1 to 3, and a dispersion medium in which the copper fine particles are dispersed.

~~5. An apparatus for producing the copper fine particles according to any one of Claims 1 to 3, wherein the apparatus includes:~~

~~a first processing unit which includes a burner forming a reducing flame, and a furnace configured to store the burner, and which is configured to heat copper or a copper compound in the reducing flame, and produce fine particles having a coating film containing copper carbonate and cuprous oxide on at least a part of the surface thereof, and~~

~~a second processing unit which is configured to bring the fine particles into contact with pure water to dissolve the copper carbonate in the coating film.~~

~~6~~5. A method for producing the copper fine particles according to any one of Claims 1 to 3, wherein the method includes:

heating copper or a copper compound in a reducing flame formed in a furnace by a burner to produce fine particles having a coating film containing copper carbonate and cuprous oxide on at least a part of the surface thereof; and

bringing the fine particles into contact with pure water to dissolve the copper carbonate in the coating film.

~~7~~6. The method for producing the copper fine particles according to Claim ~~6~~5,

wherein an amount of carbon in the fine particles is controlled by adjusting an amount of carbon in a fuel gas supplied into the burner.

~~8~~7. The method for producing the copper fine particles according to Claim ~~6~~5 or ~~7~~6,

wherein the fine particles are heat-treated in a carbon dioxide atmosphere before the fine particles are brought into contact with pure water.