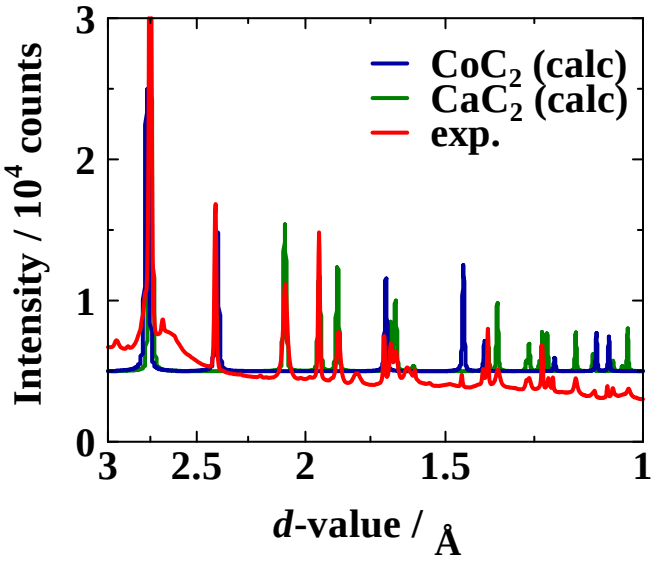
The Influence of the Coordinated Water of CoC_2 (Structural Part)

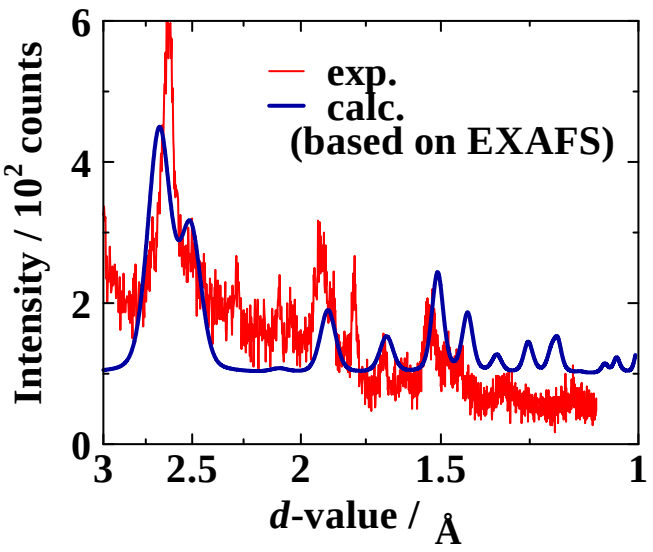
XRD

Anhydrous



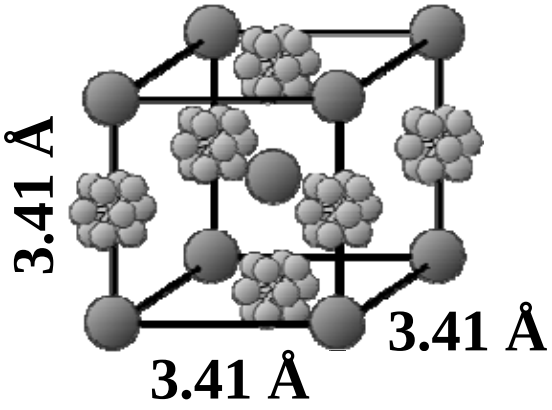
Sharp peaks: Large domain

Hydrous (Air 2 h)

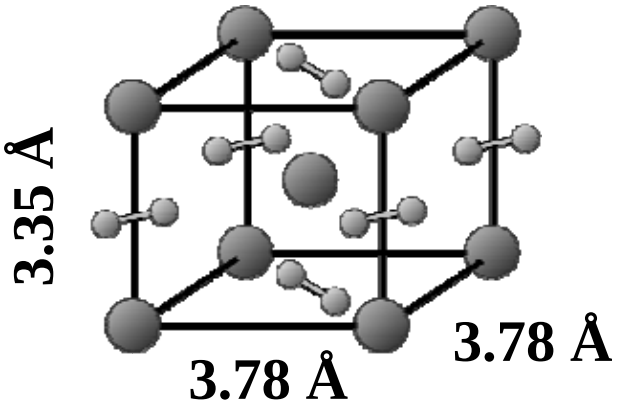


Broad peak: Small domain

Structure Model

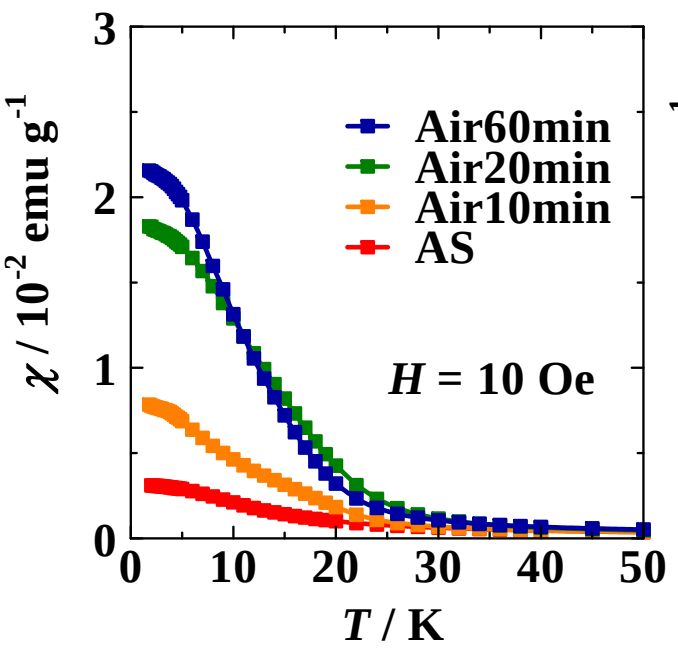


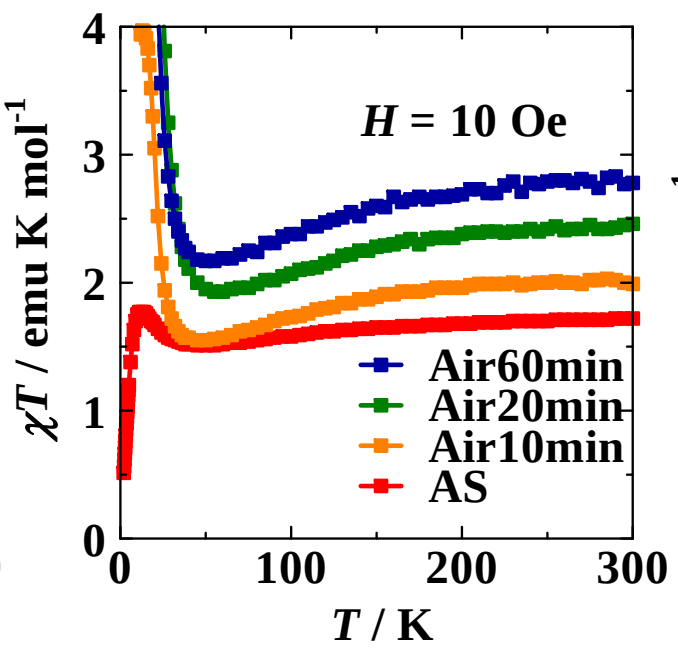
Orientation Disorder of C_2^{2-}

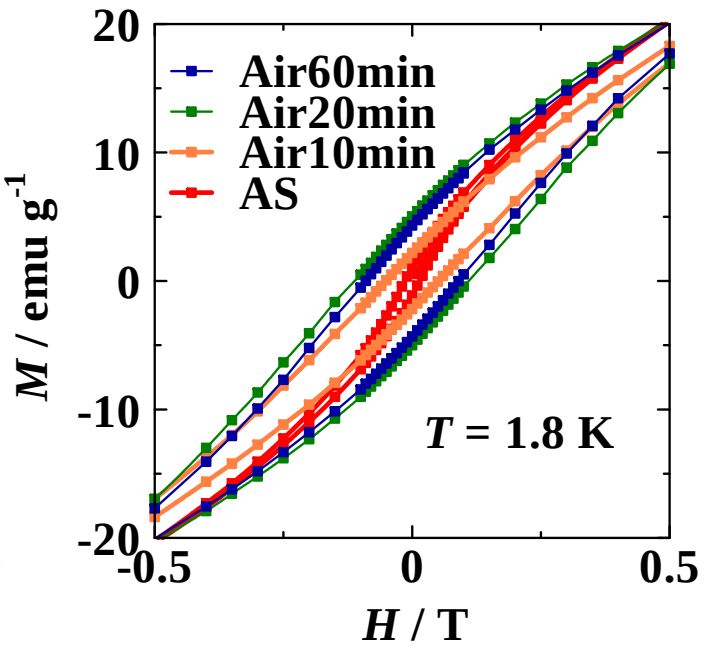


Ordered C_2^{2-}

The Influence of the Coordinated Water of CoC_2 (Magnetism)





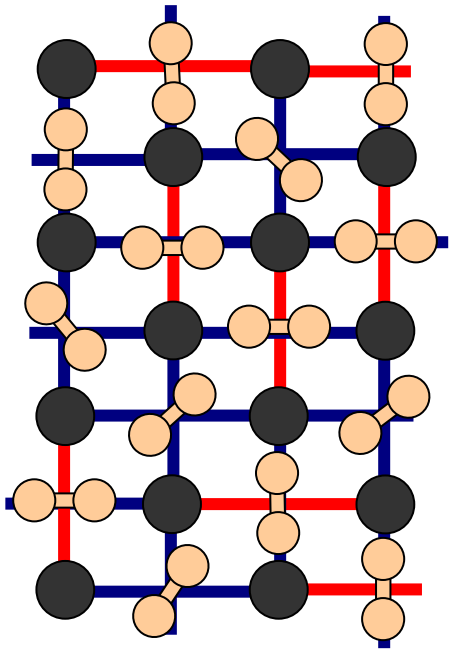


Water Absorption Enhances the Ferromagnetic Interaction

Ferromagnetic Domain Size: Small → Large

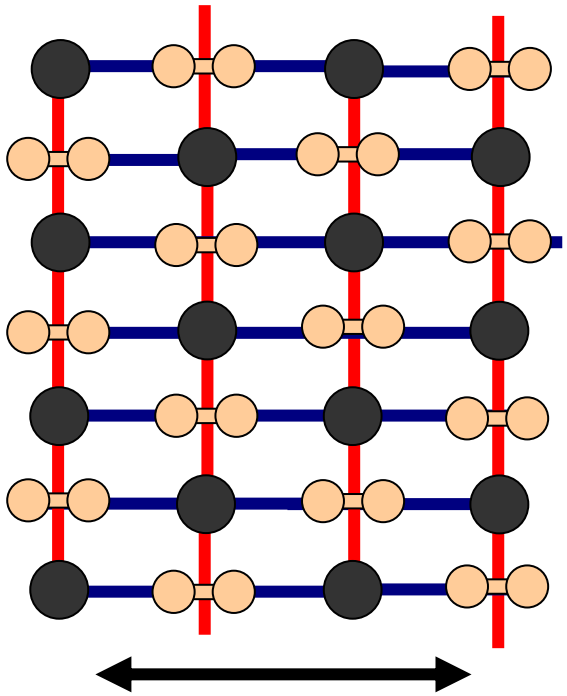
Magnetism: Superparamagnetic → Ferromagnetic

Schematic model of the influence of water absorption



Small superparamagnetic clusters

Water absorption



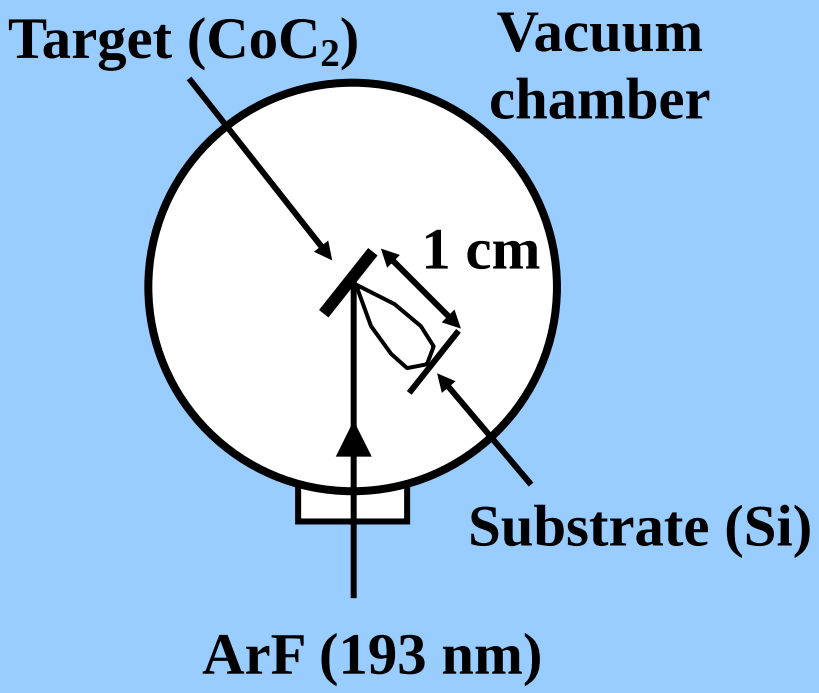
Expanded by water

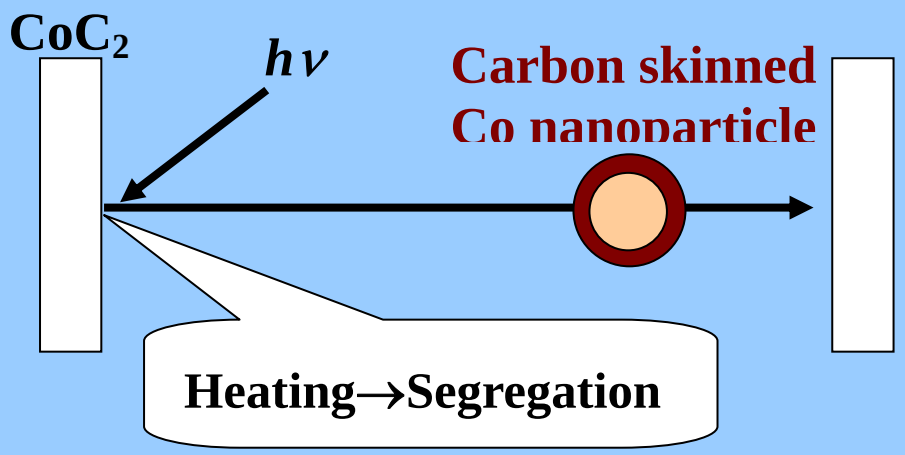
C_2^{2-} Ferromagnetic (strong)

Co^{2+} Antiferromagnetic (weak)

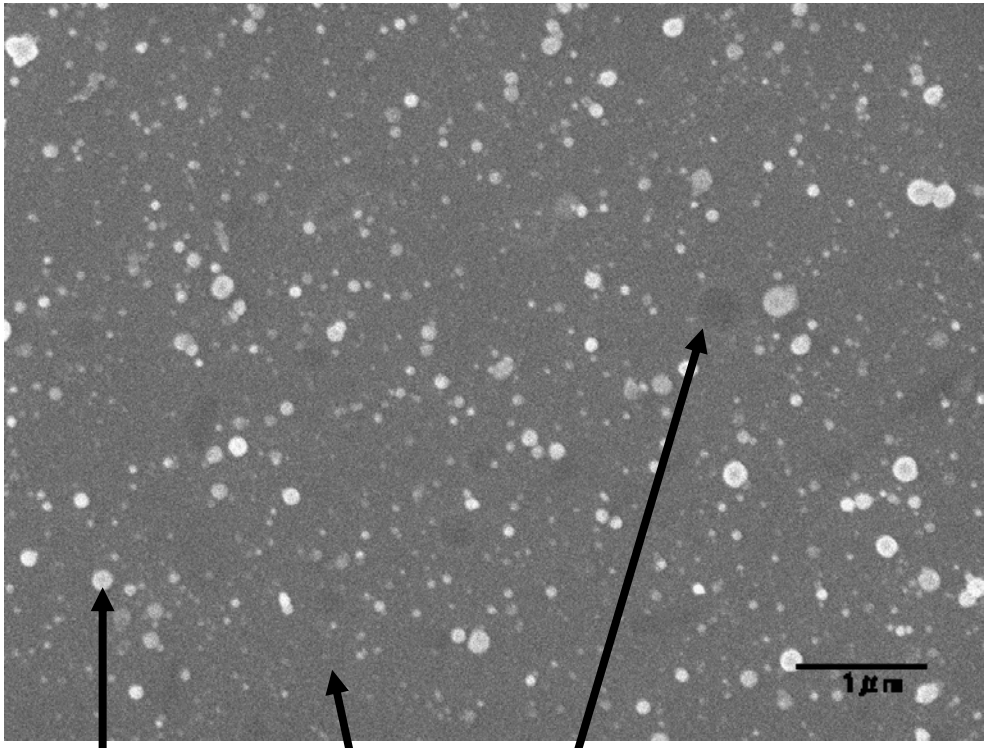
Ferromagnetic chains are formed

Thin Film of Metal Nanoparticle





After deposition

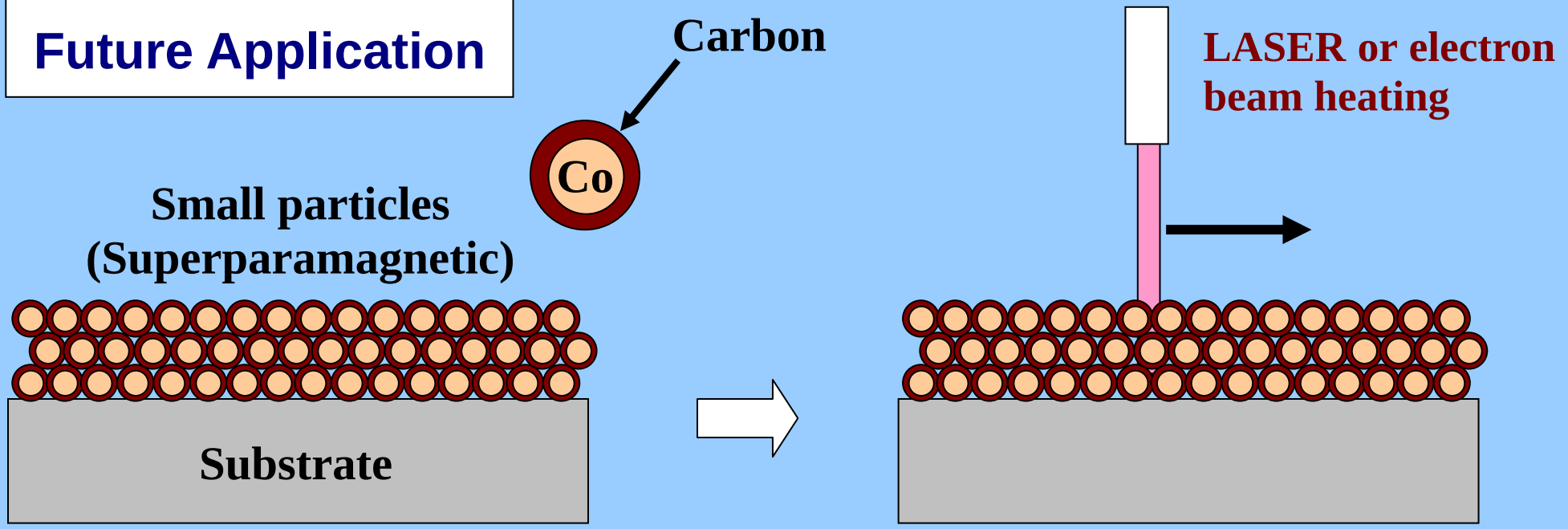


Large particle

Hole (trace of large particle)

Thin layer of small particles

Future Application



Patterned Ferromagnetic domain embedded in superparamagnets

Advantages

High oxidation resistance

carbon skins protects from oxigen

Magnetic stability for storage devices:

magnetic field of adjacent ferromagnets is screened by superparamagnets