

# “CONTINUOUS PLUG-FLOW NANOMANUFACTURING OF COPPER NANOPARTICLES” VCU #12-100

## Applications

- Healthcare, touch surfaces
- Consumer products
- Military gear

## Advantages

- Antimicrobial properties
- Quick, cost-effective manufacture
- Uniformity in production

## Inventors

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## Contact

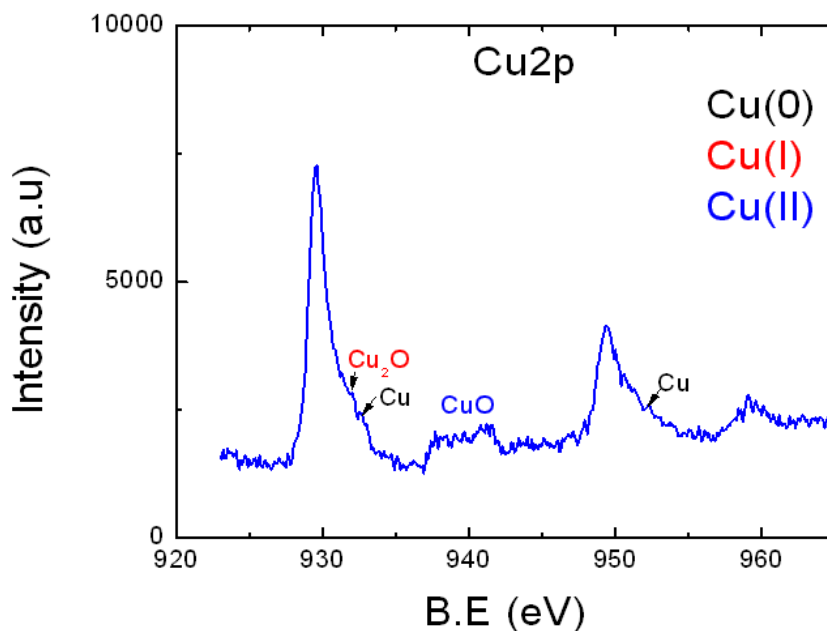
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## Market Need

Copper alloys have been studied for their antimicrobial properties and have shown to be effective at killing bacteria on its surface within two hours. For this purpose, there has been a drive to replace touch surfaces, like door knobs, with antimicrobial copper, especially in hospital settings where preventing the spread of germs is a constant struggle. Manufacturing copper nanoparticles could expand the use of antimicrobial copper to different types of products. However, affordability and uniformity between batches is often hard to achieve when dealing with the production of nanoparticles.

## Technology Summary

Researchers at VCU have developed a method of continuous flow production of nanoparticles using a process involving a supercritical solvent. The continuous plug-flow reactor eliminates the concern of batch uniformity and produces high-quality particles. This process also allows for cost-effective production, making 100 kilograms an hour of nanoparticles in dry powder form for about one dollar per gram. This process has the potential to create nanoparticles from a wide array of metals, allots, and oxides which could yield more applications with their own advantages.



## Technology Status

Particles have been created and tested using electron spectroscopy for characterization and transmission electron microscopy.

Patent pending: U.S. and foreign rights available

This technology is available for licensing to industry for further development and commercialization.