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Deadringing Copper: Amplifying the Bacteriacidal Properties of Copper and Cuprous Oxide

This experiment was tailored to identify which, if any, of the liquid compounds tested, H₂O, HCl, NaOH, and C₃H₇OH, would amplify the bacteriacidal of copper and cuprous oxide. These different liquid compounds were applied to both copper and cuprous oxide to investigate the bacteriacidal properties. The heterogeneous mixtures were then exposed to bacteria in order to observe the size of the ring of inhibition formed. After incubation of forty-eight hours at thirty-seven degrees Celsius, the average radius of the ring of inhibition was measured. The different chemical reactions between copper and cuprous oxide and the liquid compounds yielded vastly different rings of inhibition. The double displacement reaction between cuprous oxide and NaOH yielded an average ring of inhibition of 3.71mm, the single replacement reaction of copper and NaOH yielded an average ring of inhibition of 2.18mm. Cuprous oxide and HCl had an average ring of 1.745; copper and HCl had an average ring of 1.09mm; cuprous oxide and C₃H₇OH, .725mm; copper and C₃H₇OH, .69mm; cuprous oxide and H₂O, .53mm; copper and H₂O, .40mm; cuprous oxide control, .725mm; copper control, .066. Various t-Tests argue that the chance of obtaining these results from chance is low. The results indicate that the cuprous oxide is more bacteriacidal than non-oxidized copper and that applying NaOH to either cuprous oxide or copper will amplify the bacteriacidal properties by 500% or 300% respectively, while H₂O decreases the bacteriacidal properties of both compounds of copper.