

# Abstract

Sandberg, J., I. Odnevall Wallinder, C. Leygraf, and M. Virta. 2007. Release and chemical speciation of copper from anti-fouling paints with different active copper compounds in artificial seawater. *Materials and Corrosion*. Vol 58(3):165 – 172.

Release rates of total copper in artificial seawater (without organic matter) from anti-fouling paints of different active copper compounds range from 0.5 to 75  $\mu\text{g cm}^{-2} \text{ day}^{-1}$ . Approximately 80% of the released total copper was determined to be electrochemically active (labile fraction) for all paints investigated. The remaining fraction is more strongly bonded non-bioavailable copper complexes with species released from the paints. Model calculations, using MinteqA2, predicted only a small portion ( $\approx 6\%$ ) of the total copper released as free cupric ions ( $\text{Cu}(\text{H}_2\text{O})_2^{2+}$ ), the most bioavailable form of copper. Similar results were obtained with bioassay testing using bacteria and yeast on released copper from massive copper sheet exposed at identical conditions. The large difference between the total and the bioavailable copper fraction emphasizes the importance of generating chemical speciation data for accurate decisions of potential adverse effects of copper release from anti-fouling paints. The observed release of other metals and organic substances from the paint matrix, implies the importance to assess an integrated response from released species from paints of anti-fouling, and not only from single ingredients.