Hospital-associated infections (HAIs) describe infections acquired under medical care or during hospital stays. Pathogenic bacteria causing HAIs are commonly transmitted through direct contact with contaminated surfaces. Once attached to a surface as a biofilm, they can survive for an extended period of time acting as reservoir of pathogens and rapidly multiplying. For this reason, preventing bacterial colonization of surfaces in healthcare facilities is a mandatory step to limit the spread of infections.

In this context, antibacterial coatings have emerged as a necessary solution to reduce HAIs. They exert their activity by leaching loaded antibacterial compounds over time. Diamond-like carbon (DLC) is a 100% biocompatible material and is characterized for its abrasive wear resistance, corrosion resistance and chemical inertness. Its amorphous structure makes it an excellent candidate to be doped with bioactive elements such as silver. Coatings used in this setting are required to maintain their antibacterial activity for long periods of time. They should provide a sufficient, but controlled release of silver ions, to prevent rapid silver depletion within the film. As a result, studying release kinetics of silver ions is particularly important to determine the long-term effectiveness of the antibacterial action of silver-DLC coatings.

Because the concentration of the silver ions emitted from silver-DLC coatings lies at the nano and micro molar concentration level, it is indispensable to use an accurate detection device which can quantify very low ionic concentrations. Anodic stripping voltammetry (ASV) is amongst the most favorable qualitative and quantitative techniques for the determination of heavy metal ions because of its low cost, high sensitivity, and selectivity. In this work, the release from silver-DLC coatings was studied using a specifically designed ASV system and optimized for application as long-term antibacterial surfaces.

**Keywords:** Diamond-like carbon, Silver release, Voltammetry

**References:**


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