

**Supplemental document:**

**Structure and properties of novel hydrophobic Cr-Ag antibacterial coatings deposited by closed-field unbalanced magnetron sputtering.**

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The ion induced SE images of Cr-Ag coatings are shown in Fig. 1, which clearly illustrates the columnar texture of coatings. Grain growth is perpendicular to substrate surface. Moreover, columnar grain sizes increase as Ag content increases as shown in the FIB micrographs in Fig. 1 and can be confirmed from bright field TEM micrographs as shown in Fig. 2 (a) and 1(b). SAED patterns are also shown as an inset in the bright field TEM micrographs of Cr-Ag coatings in Fig. 2 (a) and 1(b) that are consistent with XRD patterns as shown in Fig. 2(c). Moreover, the XRD and SAED patterns confirms the existence of Ag (111) when Ag content is increased.

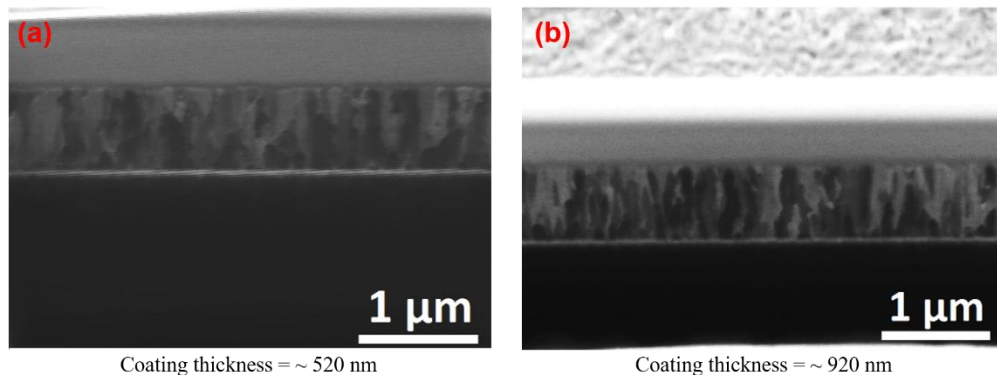


Fig. 1 Focused ion beam images of (a) Cr- 6.45 at. %Ag and (b) Cr- 0.85 at. %Ag

The hydrophobic behavior of the Cr-Ag coatings is said to increase with the increase in Ag content. The contact angle of Cr- 6.45 at. % Ag coating is shown in Fig. 2 (d) which clearly presents the hydrophobic nature of Cr-Ag coatings necessary for anti-biofouling and bactericidal effects.

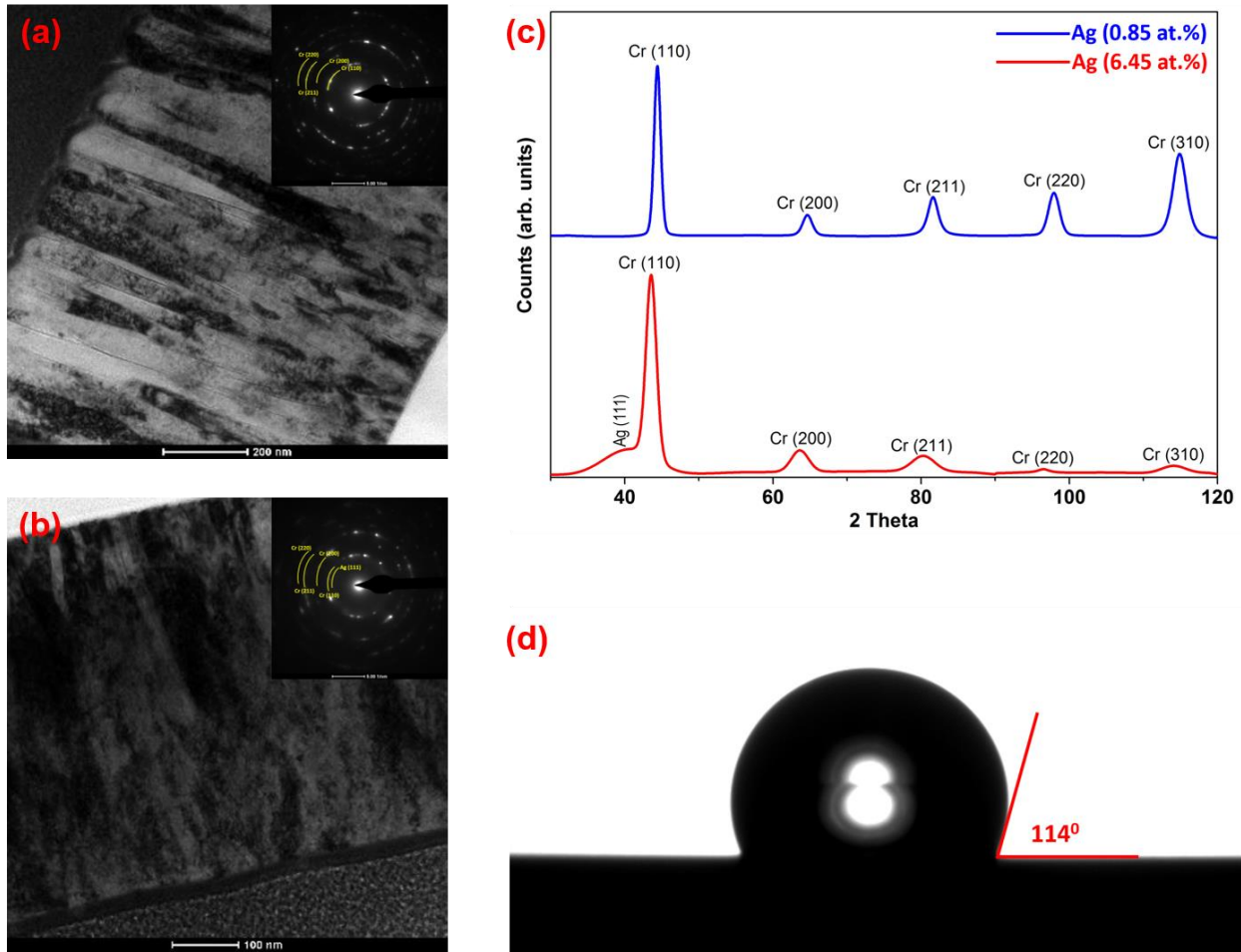


Fig. 2 BF-TEM image of (a) Cr- 6.45 at. % Ag and (b) Cr- 0.85 at. % Ag [inset: corresponding SAED patterns]; (c) XRD patterns; (d) Contact angle measurement of Cr- 6.45 at. % Ag depicting hydrophobic behavior.