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## Influence of the surface roughness on hydrophobic behaviour of Cr based coating

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The most of the recent research combine the influence of chemical composition on surface energy with convenient surface topography which should form composite interface with air pockets in the valleys between asperities. These pockets cause lowering of the real surface of contact between water and a solid in comparison with the plain projection of the wetted area, thus reducing wettability.
In general, wide spectrum of works focused on this approach often uses polymer-based nanocomposite materials. Many of these materials contain silicon and/or fluorine, since addition of these two elements further reduces wettability. However, several articles focus on hydrophobic properties of pure metallic coatings. Regarding that approach, we used magnetron sputtering method to prepare 20 μm thick coatings of pure chromium with resulting contact angle up to 107,5° (thus hydrophobic) as a model. The reason for this was to induce crystal growth resulting in specific surface roughness. Another of the tested systems was CrN/Cr showing the value of contact angle of 111°. Observation of the fracture surface of the Cr coating has proven the presence of the columnar crystals growing at the expense of their neighbors because of the prolonged deposition times. The resulting surface morphology is then formed by almost perfectly developed crystals in the shape of hexagonal pyramids providing a suitable surface roughness conditions for hydrophobicity.
The focus was to prepare convenient surface topography of the Cr coating which could serve as a substrate for additional technique altering chemical composition in order to further enhance hydrophobic properties by decreasing surface energy.
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