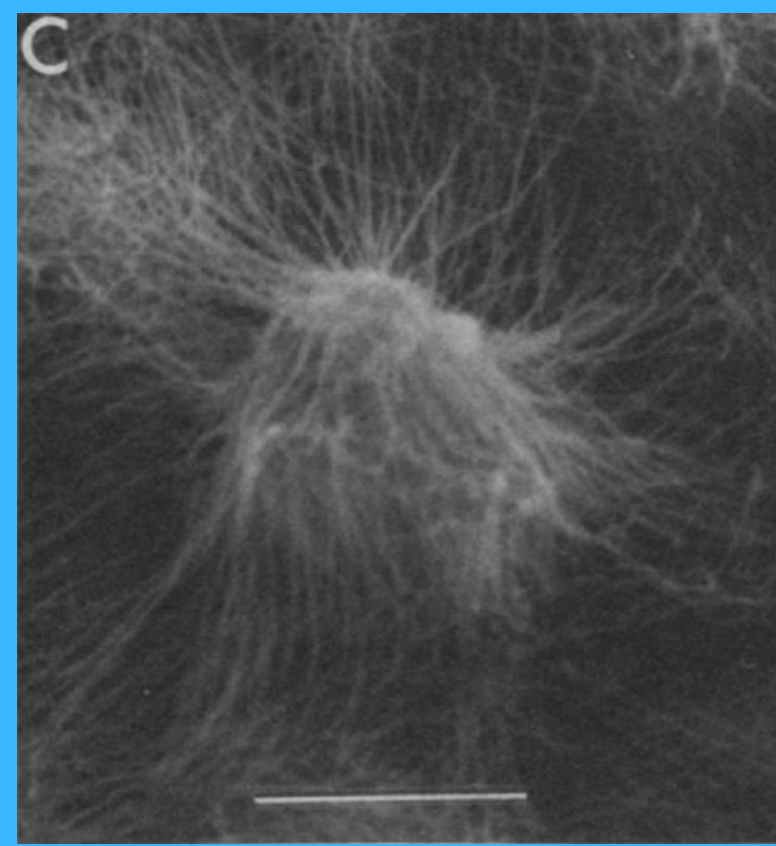




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## A photograph of two beetles on a white background. The beetle on the left is dark brown or black with a textured, pitted surface. The beetle on the right is light blue or grey with a similar textured surface and prominent legs.

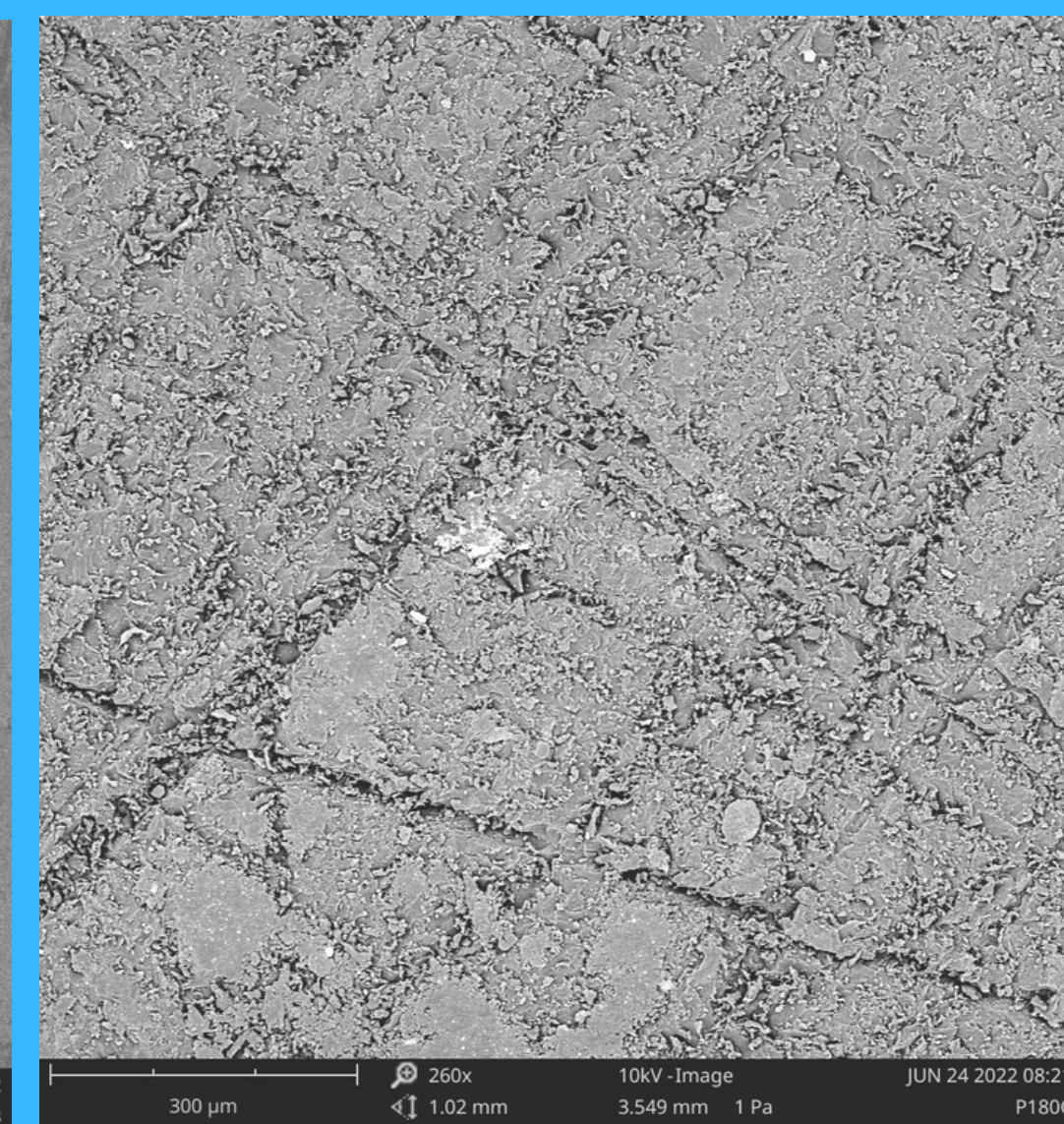



The diagram illustrates the contact angle of a liquid droplet on a solid surface. On the left, a smooth surface is shown with a liquid droplet having a contact angle  $\theta$ . The regions are labeled Vapor, Liquid, and Solid. On the right, a textured surface is shown with two states: the Wenzel state, where the droplet is in contact with the solid surface, and the Cassie-Baxter state, where the droplet is in contact with the air pockets. The contact angles for these states are labeled  $\theta_W^*$  and  $\theta_{CB}^*$  respectively.

$$\cos \theta = \frac{\gamma_{sg} - \gamma_{sl}}{\gamma_{gl}}$$

$$\cos \theta' = r \frac{\gamma_{sg} - \gamma_{sl}}{\gamma_{gl}} = r \cos \theta$$

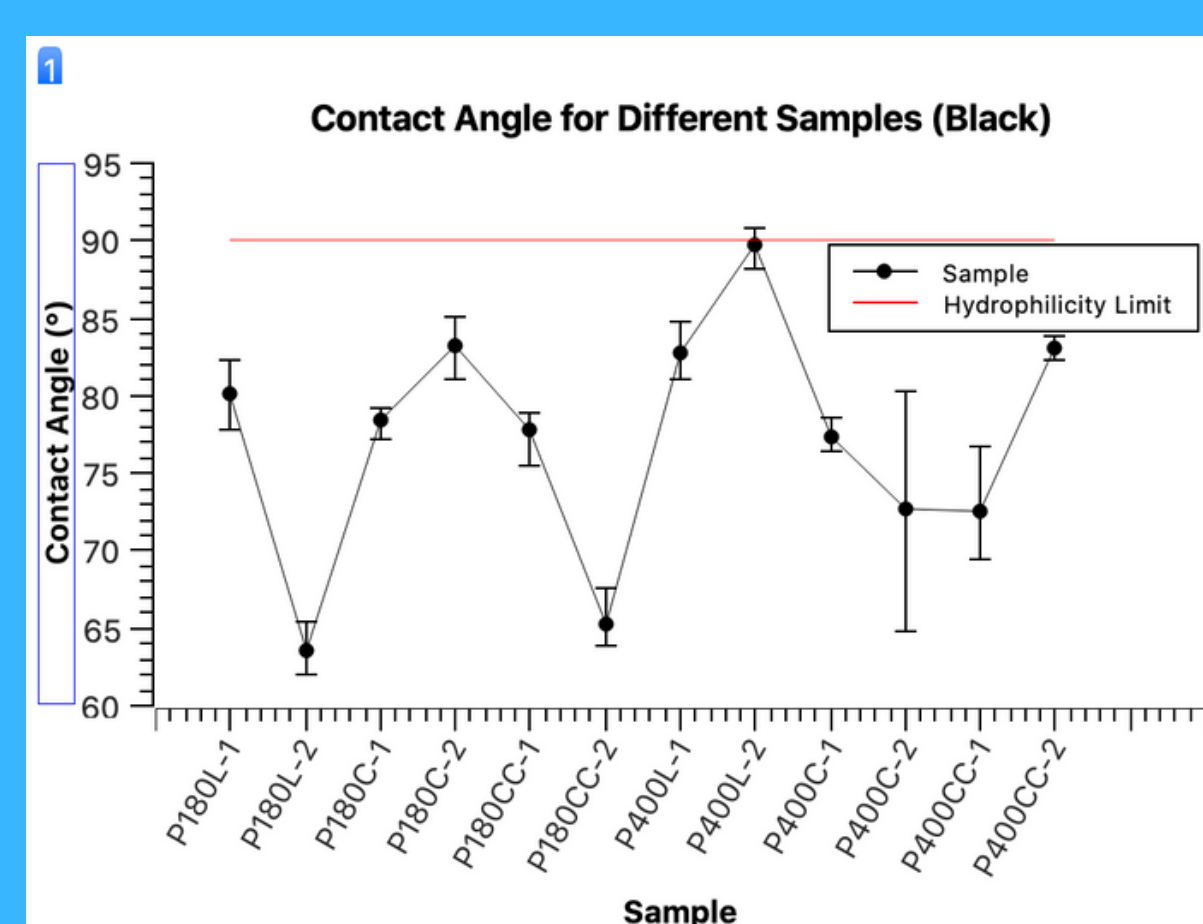
$$\begin{aligned}\cos\theta' &= f \cos\theta + (1-f) \cos 180^\circ \\ &= f \cos\theta + f - 1\end{aligned}$$



**Contact Angle for Different Samples (Black)**

Legend:   
 ● Samples   
 — Hydrophilicity Limit

Sample	Contact Angle (°)
R4D0020	83
R4D0030	82
R4D0070	78
R5D0020	83
R5D0030	80
R5D0040	79
R5D0050	79
R5D0060	67
R6D0020	65
R6D0030	79
R6D0040	81
R7D0020	70
R7D0030	86
R7D0040	70

[illegible]

**Contact Angle for Different Samples (White)**

Sample	Contact Angle (°)
P180-1	~84
P180-2	~69
P180C-1	~64
P180C-2	~83
P180CC-1	~79
P180CC-2	~85
P400-1	~77
P400-2	~62
P400C-1	~67
P400C-2	~73
P400CC-1	~77
P400CC-2	~72

**Contact Angle-Average Height Profile Graph (Black)**

Average Height Profile Ra (μm)	Contact Angle (°)
0.7	83
0.8	83
0.8	72.5
0.9	73
1.3	90
2.3	78.5
2.7	80
2.8	64
3.0	83
3.2	77.5
3.6	65.5

