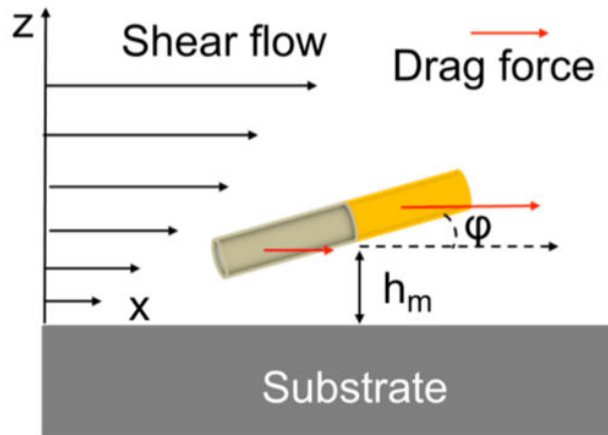


# Acoustic Regulated Rheotaxis of Catalytic Micromotors

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The  $H_2O_2$  powered bimetallic micromotors can respond to shear flow and exhibit rheotactic behavior. When a negative charged surface is presented, the bimetallic nanorod interacts with the surface through the local electric field induced by asymmetric decomposition of  $H_2O_2$ , resulting in a tilted angle between the nanorod and the surface. Consequently, the tilted nanorod experiences a shear force and aligns itself against the flow. By choosing proper combination of bimetallic nanorods, acoustic wave can accelerate or reverse the motion of catalytic micromotors. Combining the acoustic regulation with catalytic propulsion, both positive rheotaxis (Rh-Au) and negative rheotaxis (Au-Ru) have been demonstrated. This phenomenon can play a significant role in targeted cargo delivery.

