Anisotropic photocatalytic micromotors for environmental remediation

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Photoactivated micromachines are at the forefront of the micro- and nanomotors field, as light is the main power source of many biological systems. Among the different materials that have been explored for the design of light-driven micromotors, photocatalytic-based systems are the most promising due to their fast response to light stimuli, notable speeds, and remarkable chemical stability.[1] Here, we present anisotropic Ag_3PO_4 and $BiVO_4$-based micromotors, as highly scalable and low-cost micromachines, that can be actuated by turning on/off the light source (Figure 1). The capabilities of these micromotors to interact with the surrounding environment, *e.g.*, metal ions,[2] yeast cells, and passive particles were investigated.[3-4] Interestingly, we observed that such micromotors adjusted their motion speeds and trajectory in the presence of chemical and biological interferences. Furthermore, we demonstrated that surface molecular imprinting polymer is a promising approach to improve their photoactivity toward the removal of persistent organic pollutants.[5] Therefore, photocatalytic micromotors hold promising applications in the fields of photocatalytic disinfection, water treatment, and the food industry.

References

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[5] X. Yuan, et al. Small 2023, 2207303.

Figures

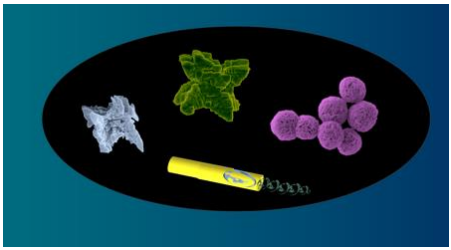

Figure 1: Visible light-responsive photocatalytic micromotors