

Fabrication and developing small scale motors which can propel itself without external energy source is one of the challenges facing many fields of science including physics. They are of interest for a number of reasons, including potential to transport tasks in drug delivery. Recently, self-phoretic motors have attracted many interests. These motors are able to move in a fluid by means of promoting surface chemical reactions. These reactions take place asymmetrically on the surface of motors, e.g. parts of the surface release some molecules (or ions), some parts consume them, and some parts are inert. Therefore, gradients in composition of the solution occur. Interaction of molecules (or ions) with surface of the particle leads to gradients in osmotic pressure along the surface and subsequently produce a flow which is accounted via a phoretic slip velocity on the surface. This mechanism enables such active particles to propel themselves in the fluid.

In This talk, I will give an introduction of self-phoretic motors, how they move and what is the physics behind their motion. In the following, I will talk about my PhD thesis which I have studied self-phoretic particles and their interactions, theoretically.