Imagine you're running a chemical reaction in a PFR reactor.In this reactor, the rate at which the reaction happens (let's call it −rA−rA) depends on the concentration of one of the substances involved in the reaction (let's call it AA).So, if you double the concentration of AA, the reaction rate doesn't just double, it quadruples because you're squaring the concentration.Now, in this case, the rate at which AA reacts is proportional to the square of its concentration.