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Reply

In their letter Konyukhov and Zyskin (*1*) reported that they were able to fit our experimental rate data on vapor-phase hydrogenation of benzene over nickel catalyst (*2*) to a rate expression much simpler than our own. They claimed slightly superior standard deviation despite the simplicity.

We referred in our paper to a reported observation that at least two distinct chemisorbed forms of benzene—horizontal π-bonded species and vertical σ-bonded species—exist in equilibrium on the nickel surface (*3*). A third intermediate form was also postulated. Several suggestions have been made regarding the reactivity of these different species. Hydrogenation of benzene is believed to be a facile reaction (*4*) and the presence of the localized σ-bonded surface complex of benzene may inhibit the reaction by unproductive occupation of active sites. Our work was motivated by these facts as well as some of the observed kinetic features of hydrogenation of benzene such as rate maxima. We believe that the simpler model, though statistically as consistent as ours, may not reflect the mechanistic features of hydrogenation of benzene.

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