

Figure S1: **Rapid Compression Machine:** experimental and computed delay times versus compressed gas temperature for *n*-butylbenzene/oxygen/nitrogen/argon/carbon dioxide mixtures with $\Phi = 0.4$ at P_{TDC} from 14.3 to 18.3 bar (initial pressure of 700 Torr) and $\Phi = 1$ (experiments from [15]) at P_{TDC} from 13.4 to 17.9 bar (initial pressure of 700 Torr). Points are experiments and lines simulations.

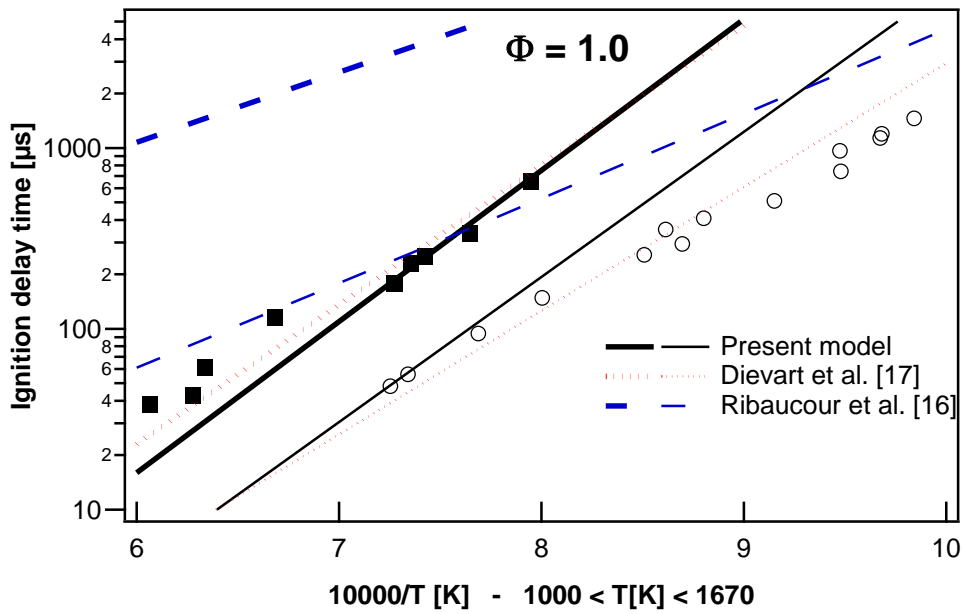


Figure S2: **Shock Tube**: experimental and computed delay times versus temperature after reflected shock wave for stoichiometric mixtures. Points (black squares for 1 bar, white circles for 10 bar) are experiments and lines (thick lines for 1 bar, thin lines for 10 bar) are simulations.

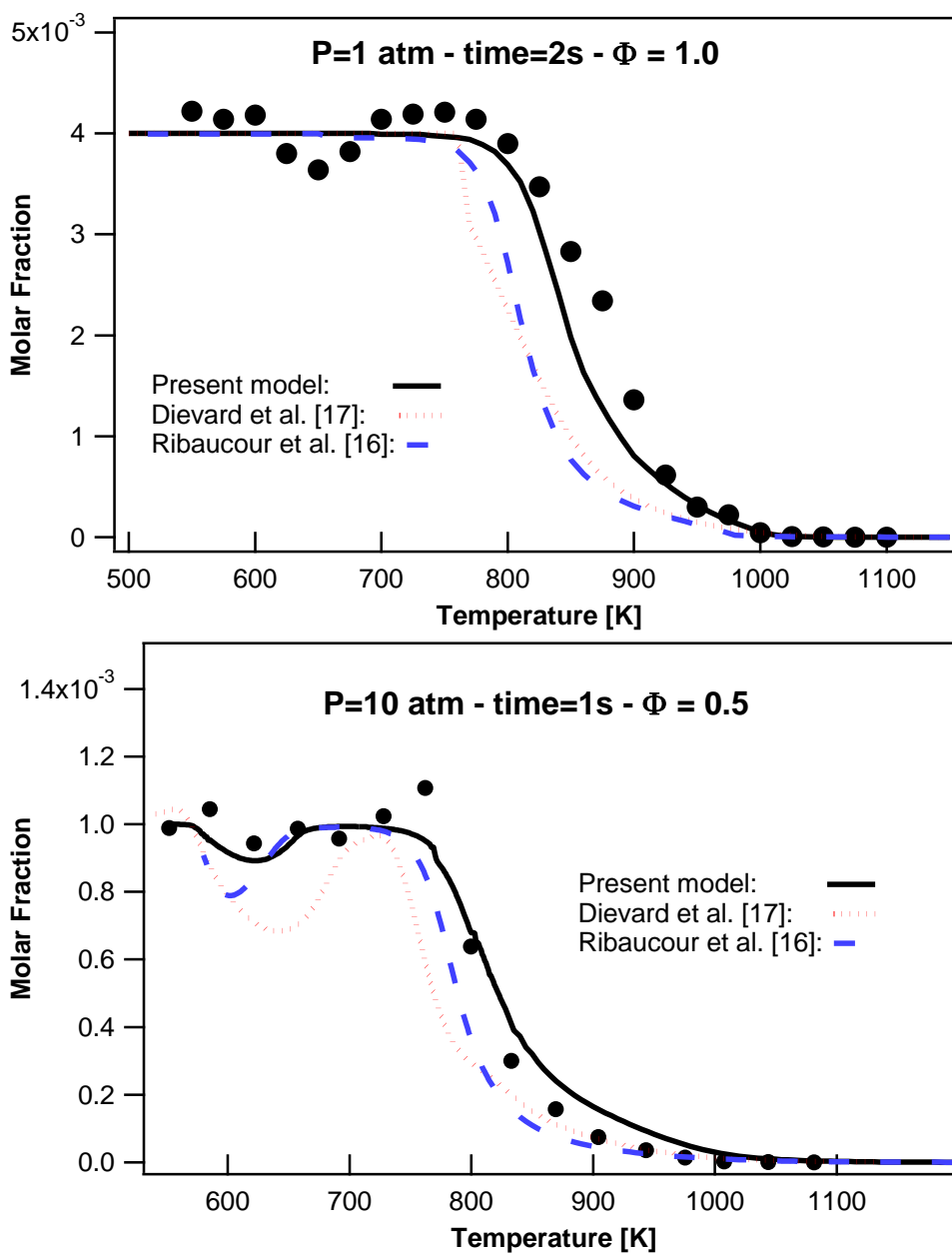


Figure S3: **Jet-Stirred Reactors:** experimental and simulated mole fractions versus temperature for *n*-butylbenzene/oxygen/inert gas mixtures oxidation. Points are experiments and lines simulations.