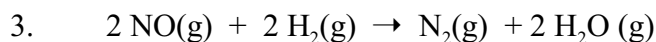


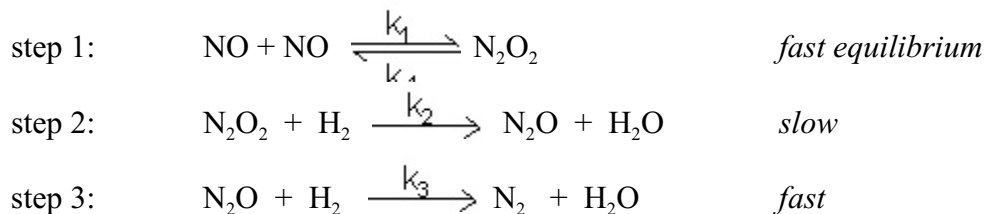
## Worksheet 8

1. Molecular iodine,  $I_2(g)$  dissociates into iodine atoms at 625 K with a first-order rate constant of  $0.271 s^{-1}$ . a) What is the half-life for this reaction? b) If you start with  $0.050 M I_2$  at this temperature, how much will remain after 5.12 s. Assume that the iodine atoms do not recombine to form  $I_2$ ?
2. Cobalt-60 has a half-life of 5.26 years. The cobalt-60 in a radiotherapy unit must be replaced when its radioactivity falls to 75% of the original sample. If the original sample was purchased in August 2008, when will it be necessary to replace the cobalt-60?



experimental rate law =  $k [NO]^2 [H_2]$

The following mechanism has been proposed for the gas-phase reaction of NO and  $H_2$ .



- a) What is the molecularity of each step? b) List any intermediates. c) Does the overall reaction agree with the experimental reaction? d) Show that the predicted rate law equals (or does not equal) the experimental rate law.