35. (a) Our calculation is identical to that in Sample Problem 44-4 except that we are now using R appropriate to two deuterons coming into "contact," as opposed to the $R = 1.0\,\text{fm}$ value used in the Sample Problem. If we use $R = 2.1\,\text{fm}$ for the deuterons (this is the value given in problem 33), then our K is simply the K calculated in Sample Problem 44-4, divided by 2.1:

$$K_{d+d} = \frac{K_{p+p}}{2.1} = \frac{360\,\text{keV}}{2.1} \approx 170\ \text{keV} .$$

Consequently, the voltage needed to accelerate each deuteron from rest to that value of K is $170\,\text{kV}$.

(b) Not all deuterons that are accelerated towards each other will come into "contact" and not all of those that do so will undergo nuclear fusion. Thus, a great many deuterons must be repeatedly encountering other deuterons in order to produce a macroscopic energy release. An accelerator needs a fairly good vacuum in its beam pipe, and a very large number flux is either impractical and/or very expensive. Regarding expense, there are other factors that have dissuaded researchers from using accelerators to build a controlled fusion "reactor," but those factors may become less important in the future – making the feasibility of accelerator "add-on's" to magnetic and inertial confinement schemes more cost-effective.