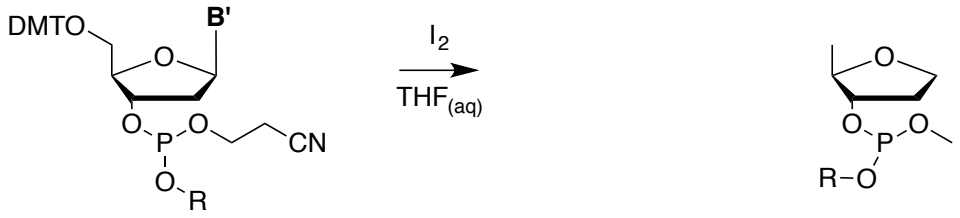
The acid used must be mild enough to promote the reaction without removing the DMT group. *Tetrazole / pyridine / pyrrole* is a preferred acid for this step.

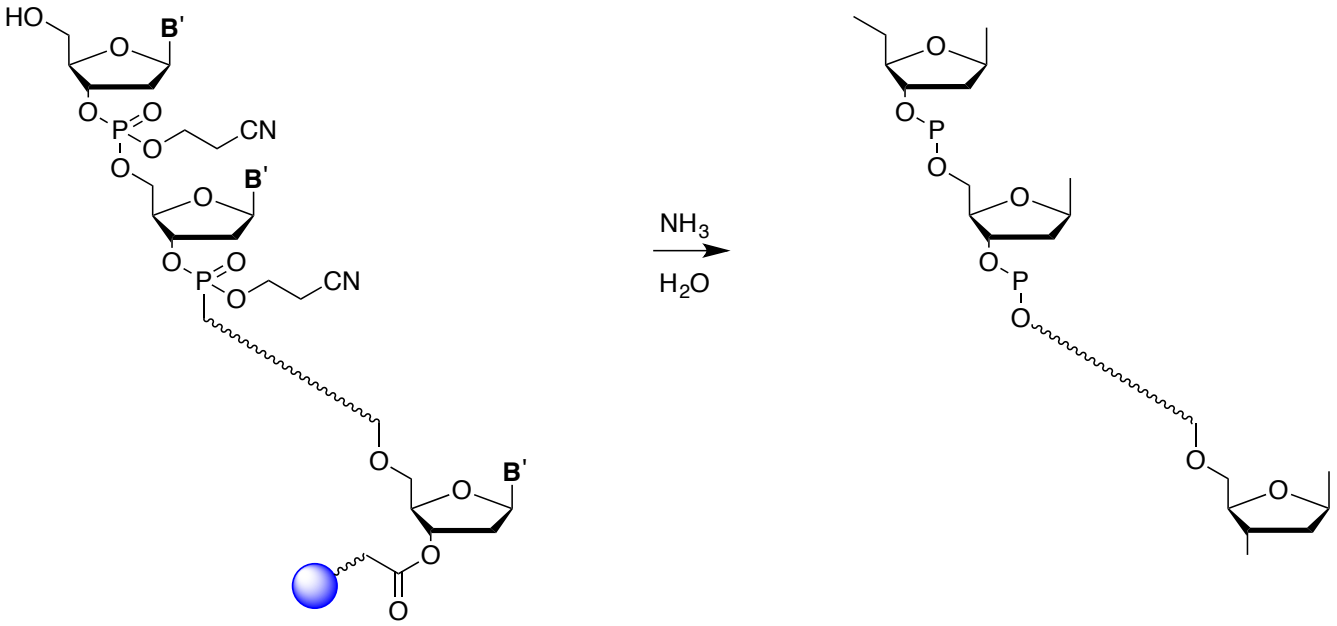
Coupling, as shown above, is the first step in each cycle of DNA syntheses, and the last is DMT removal. Between these comes *oxidation / reduction* of the *P*-atom in the phosphoramidite.

Complete the following structures to show that.



phosphotriester

The oxidation state of the starting phosphoramidite is *0 / 1 / 2 / 3 / 4 / 5 / 6*, and that of the phosphodiester product is *0 / 1 / 2 / 3 / 4 / 5 / 6*.

After repetitive couplings of phosphoramidite, oxidation, then DMT removal, DNA is cleaved from the support by treatment with ammonia; this *also removes / does not remove* the *iso*-butyryl, benzoyl, and cyanoethyl protecting groups.

Complete the following diagram to show the product of this reaction (recall **B'** stands for *protected* base).