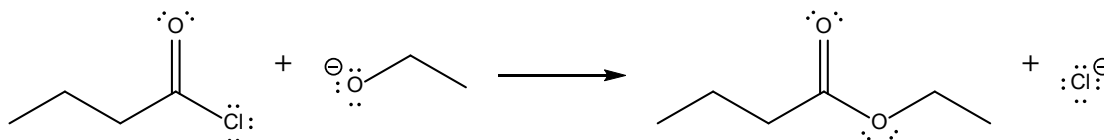


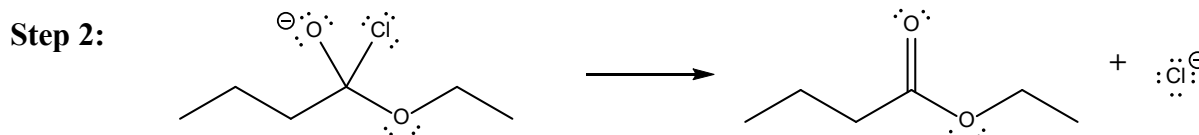
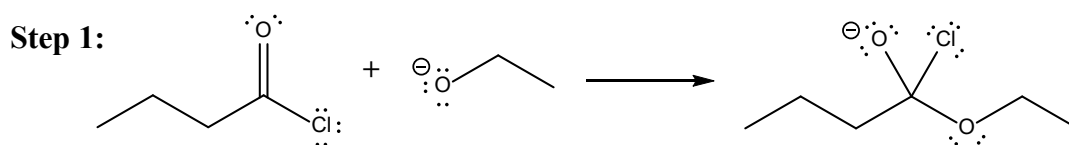
## Answers to Exercise 11.3

### Categories of Organic Reactions

1. At first glance the following reaction appears to be a substitution:



If you look at its mechanism, however, you can see that this is actually a 2-step process:

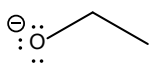


The first step is an addition while the second step is an elimination. As such, this reaction is more properly described as an addition-elimination reaction (*in which the first word refers to the classification of the first step and the second word refers to the classification of the second step*).

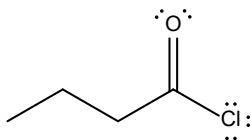
*Please note that you are not expected to be able to predict what the steps look like within a reaction class you have not previously seen. This question is only fair because the steps are shown.*

2.

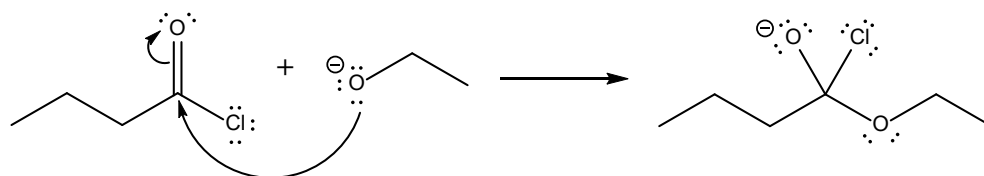
(a)



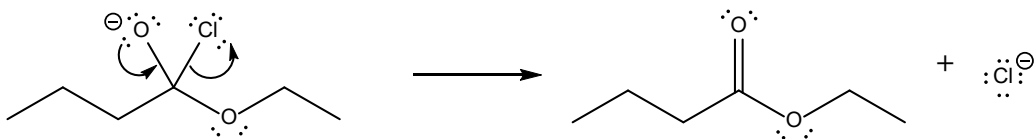
(b)



(c)



(d)



*Please note that arrows creating a new bond point directly to the atom to which the bond is being made; however, arrows increasing bond order (taking a single bond to a double bond, for example) point directly at the bond. Arrows showing the movement of an electron pair onto a single atom as a lone pair point directly at that atom. Arrows always start at the electron pair that is moving (either a lone pair or a bonding pair of electrons).*