

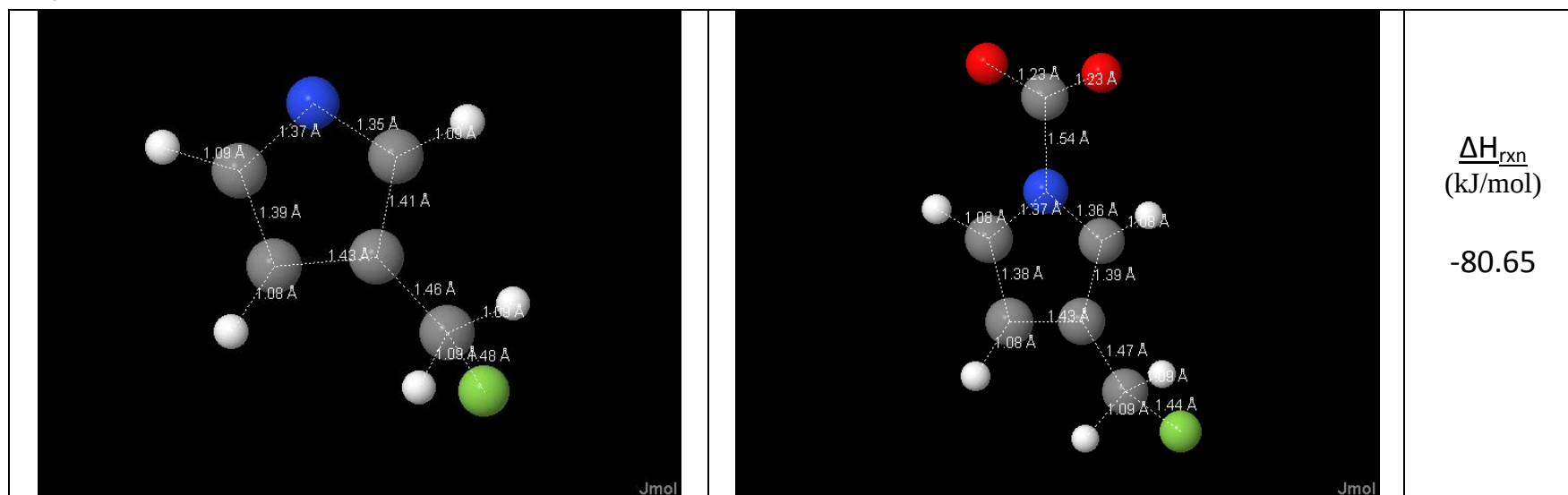
Supplemental Information

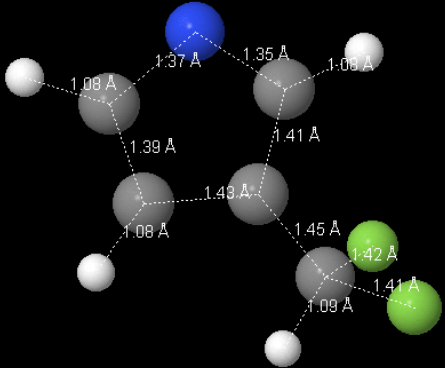
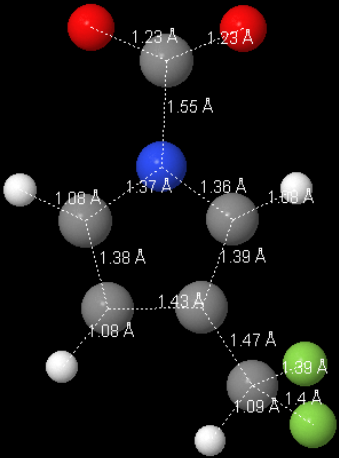
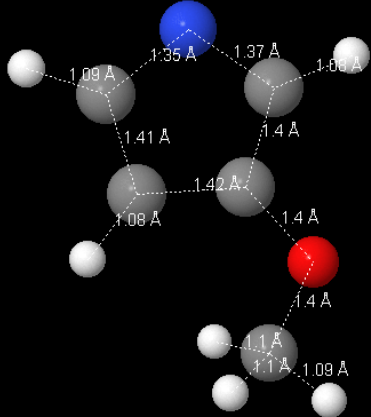
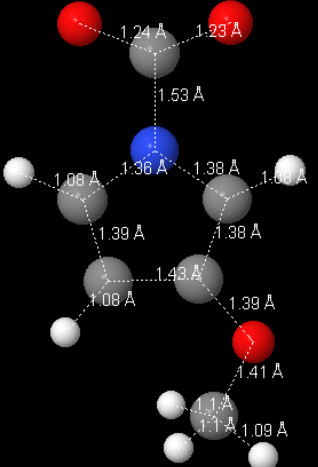
Section A.1: Pyrrolide	2
Section A.2: Indolide.....	8
Section A.3: Pyrazolide	22
Section A.4: Imidazolide	26
Section A.5: Benzimidazolide.....	31

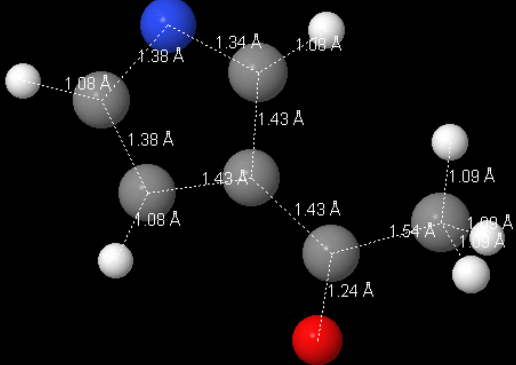
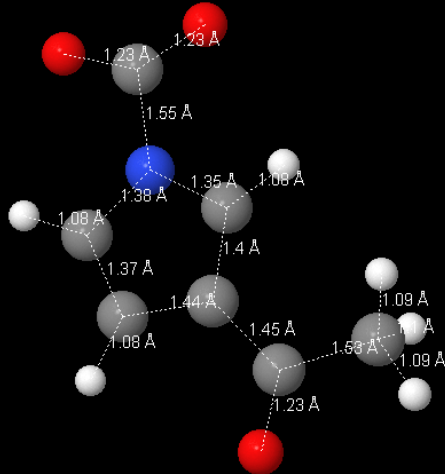
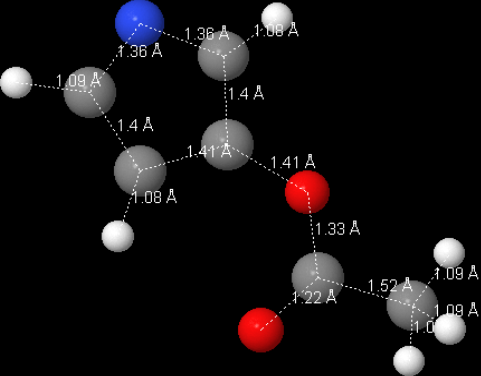
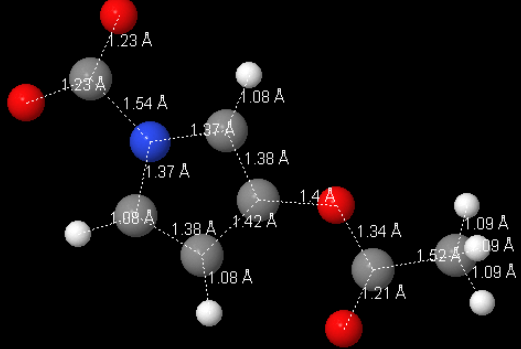
Computational Method

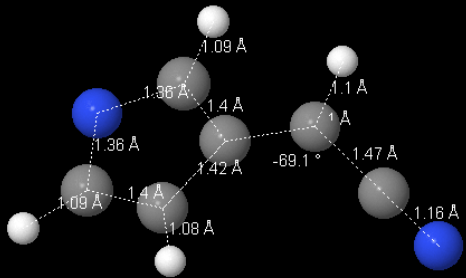
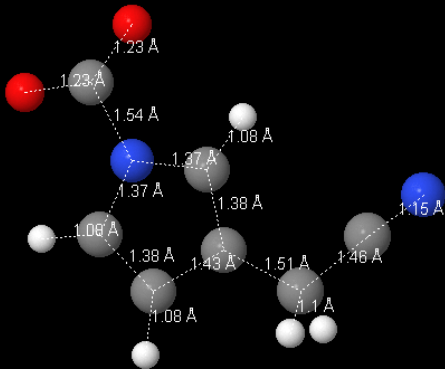
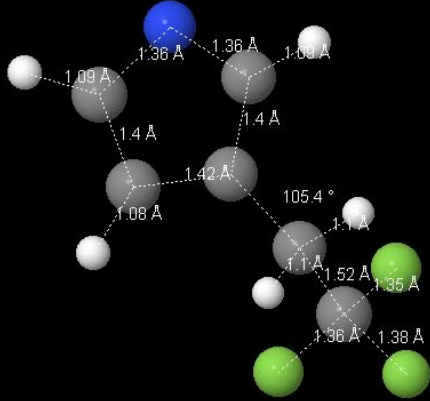
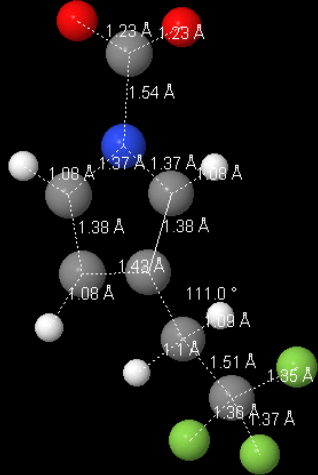
The following supplemental information contains the optimized structures of both reactant and product structures for the reaction: $IL^- + CO_2 \rightarrow IL-CO_2^-$, where IL^- represents the ionic liquid anion that binds CO_2 . The reaction enthalpies shown in Figure 7, were calculated as the enthalpy difference between the respective product and reactant states. The functional and basis set used in all calculations was B3LYP 6-311++G (d,p). A tight force convergence criterion, in which the RMS force convergence criterion is 10^{-5} Hartrees/Bohr, was used. Zero point vibrational energies were calculated using the harmonic oscillator approximation. Also, T=298K vibrational corrections were calculated for determining ΔH_{rxn} at 298 K. All of the above calculations were implemented in the GAUSSIAN 2003 software package.

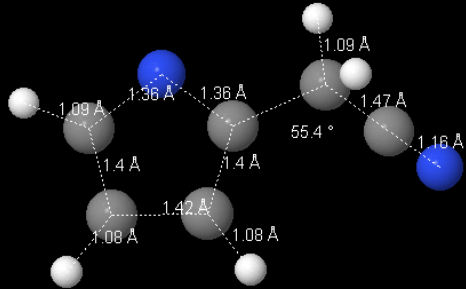
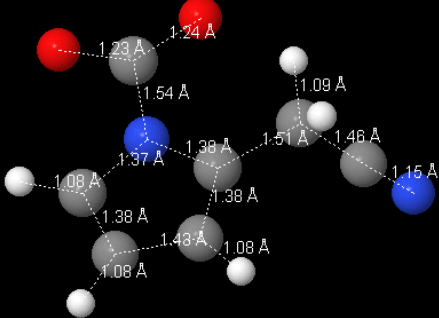
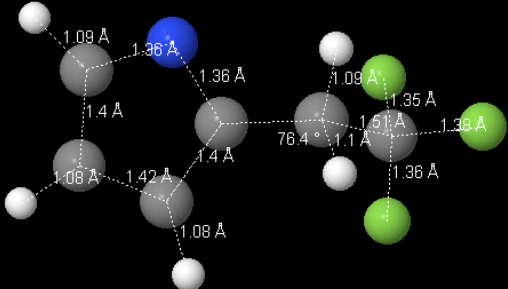
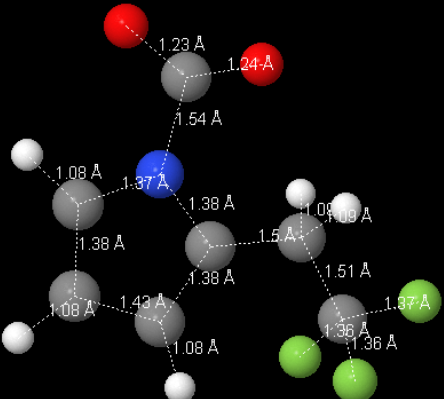
Pyrrolides

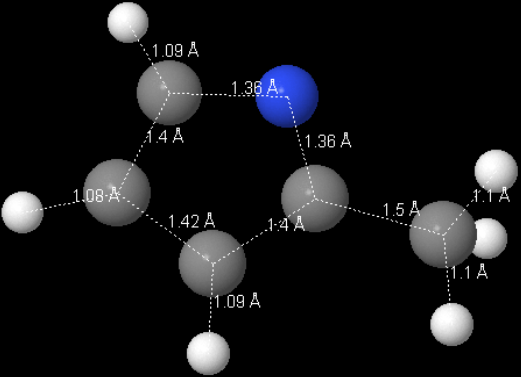
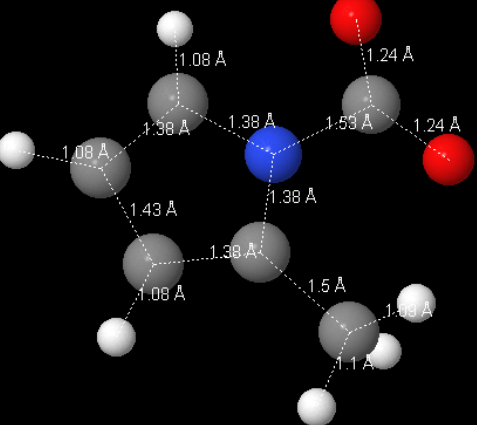
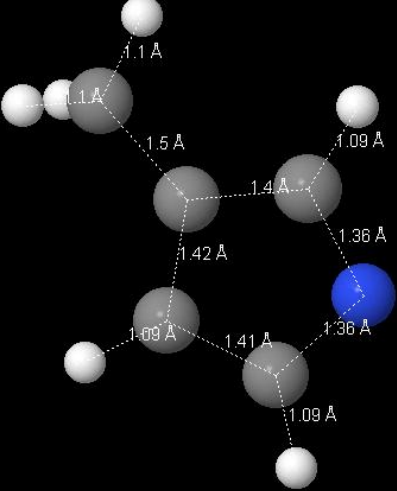
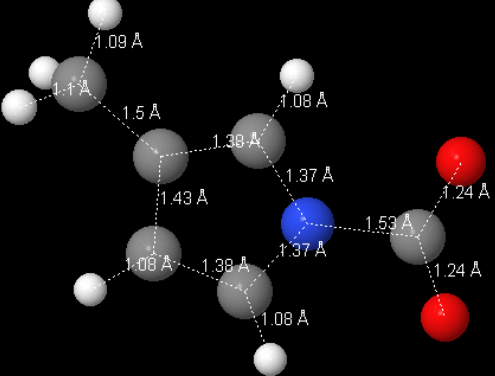


 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -70.8
 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -94.4

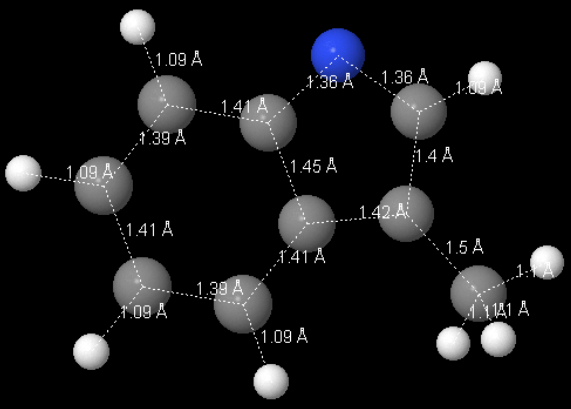
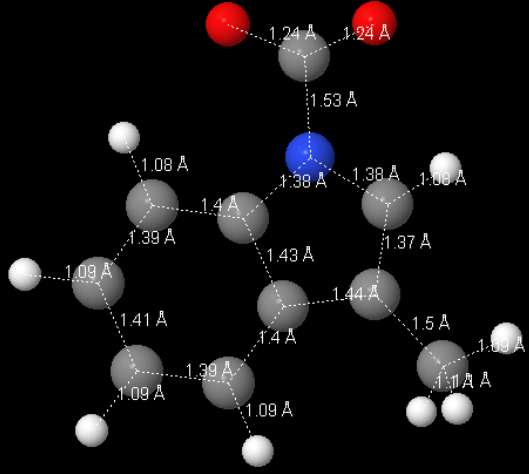
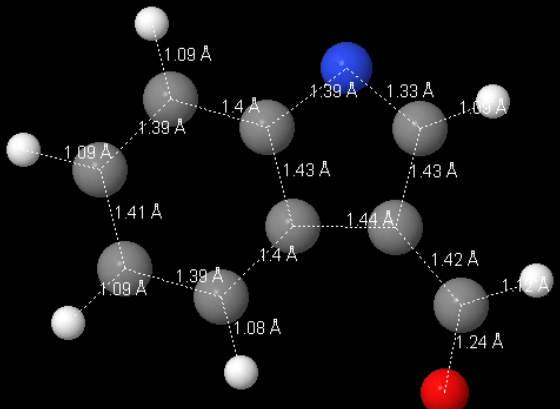
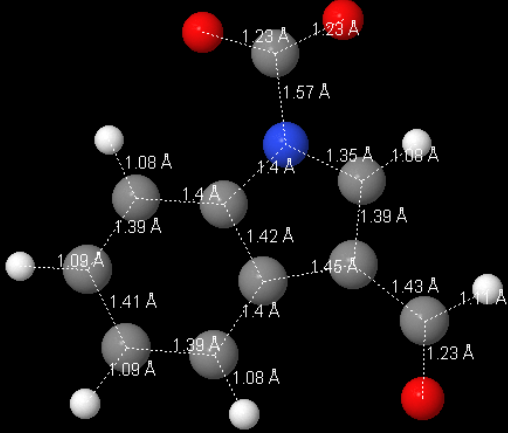
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -67.0
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -82.5

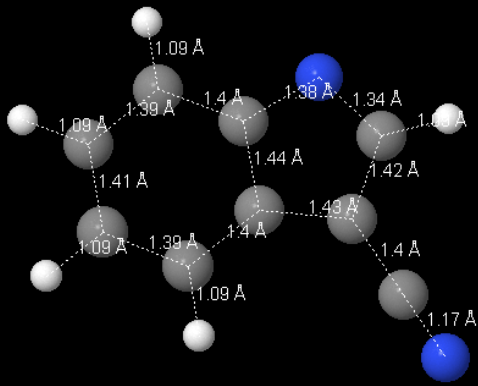
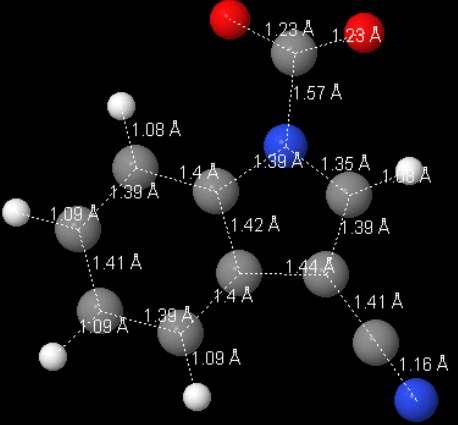
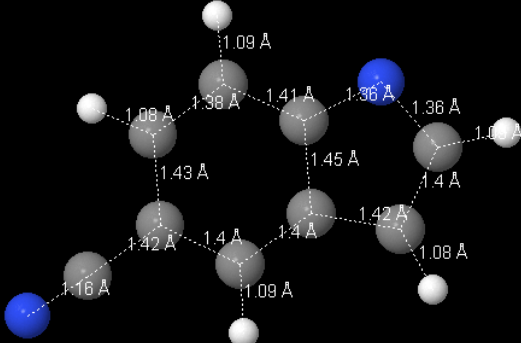
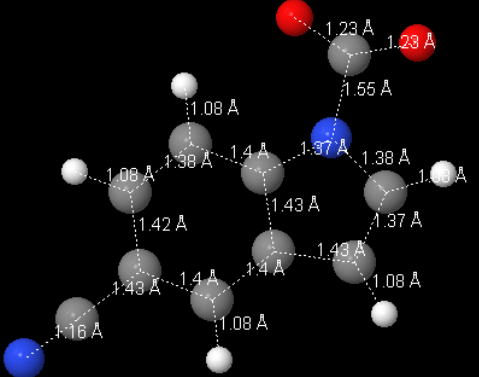
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -76.5
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -82.7

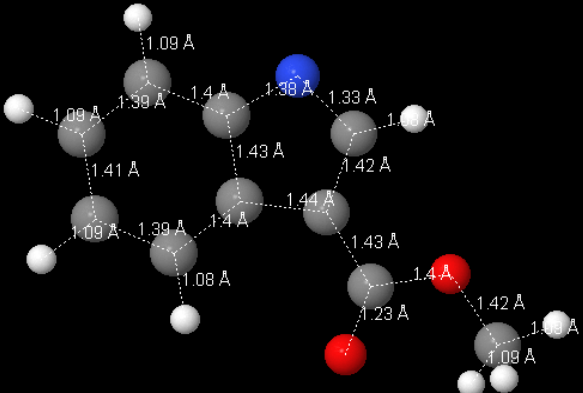
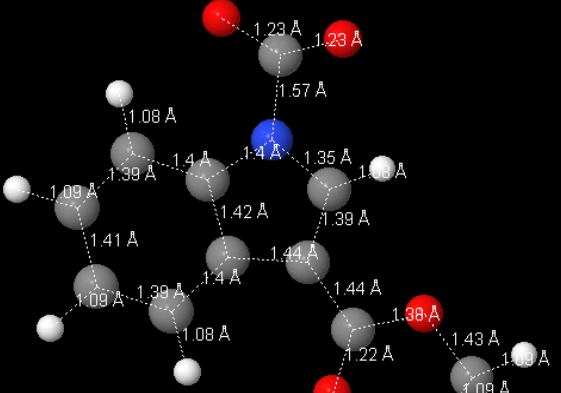
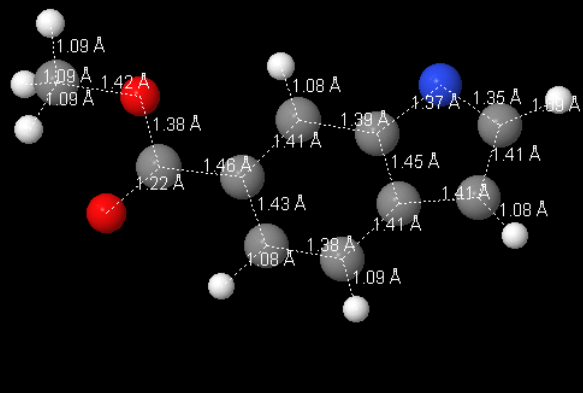
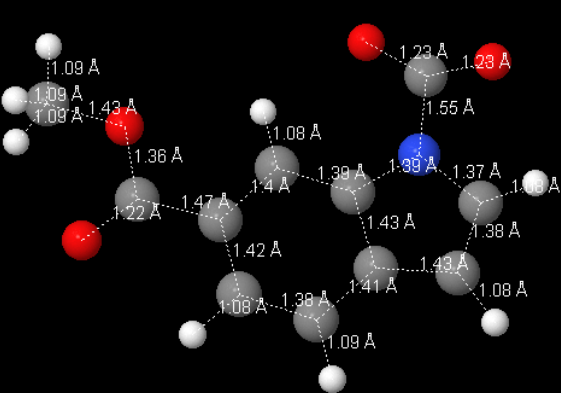
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -76.4
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -69.9

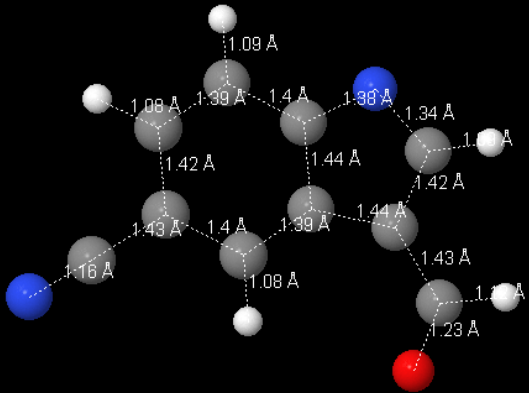
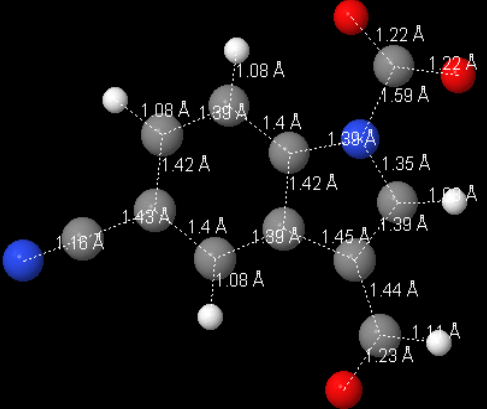
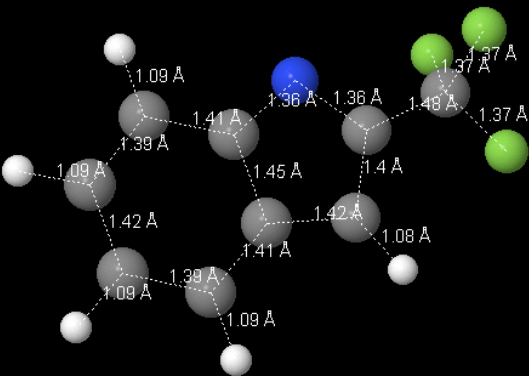
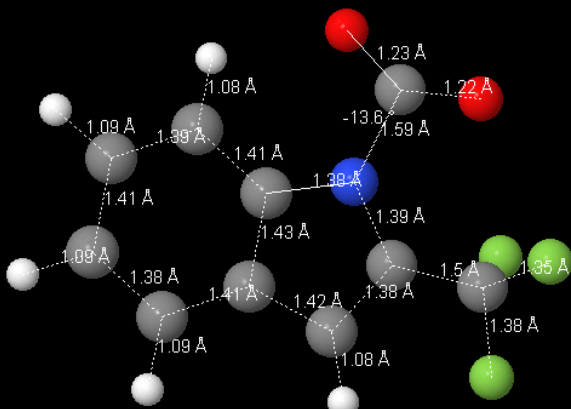
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -89.8
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -99.8

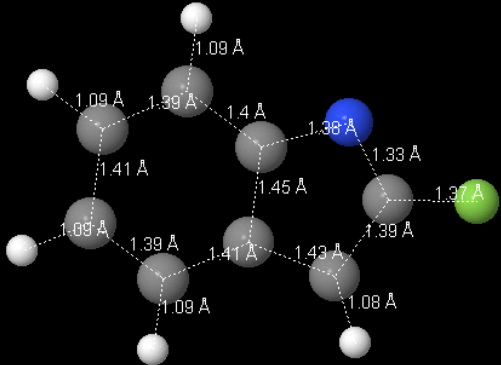
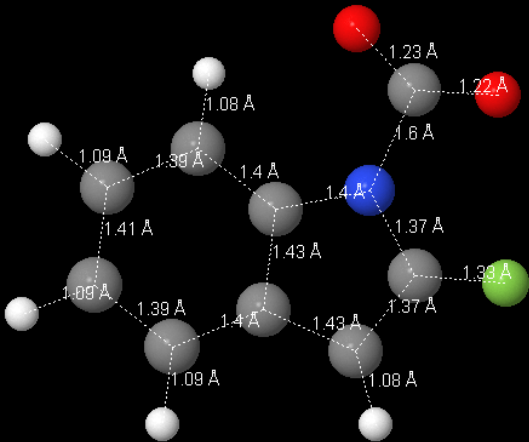
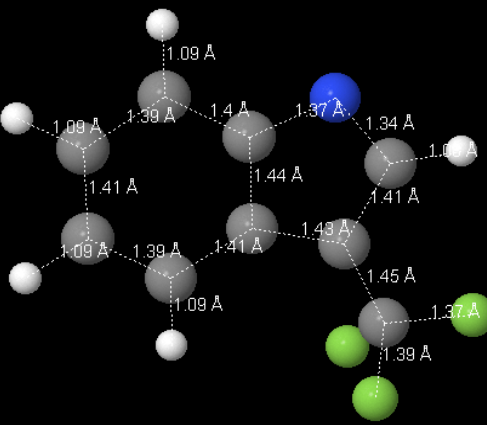
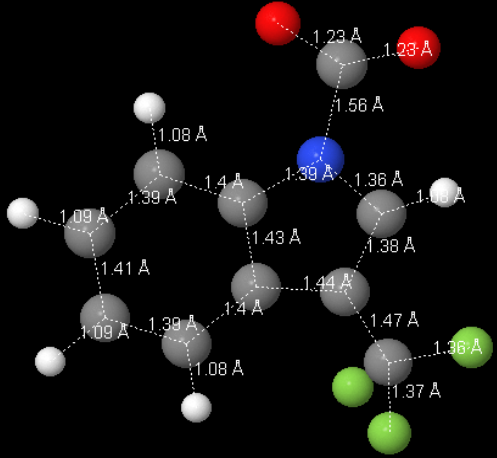
Indolides

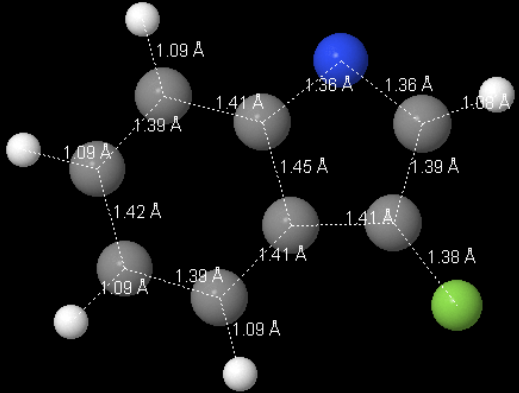
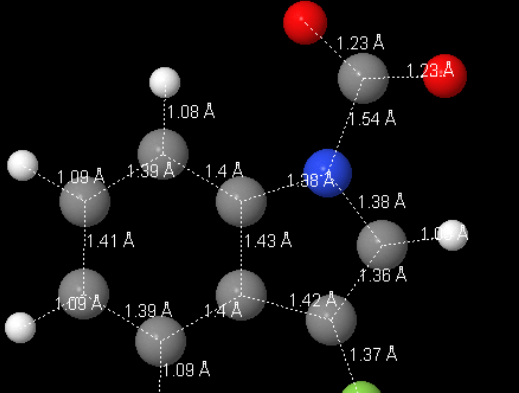
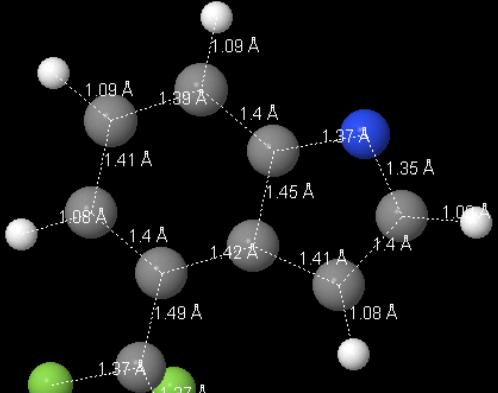
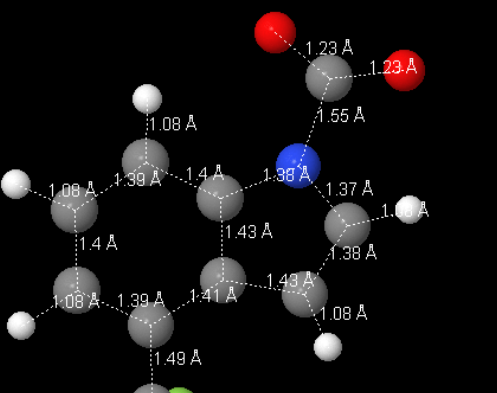
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -73.6
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -40.4

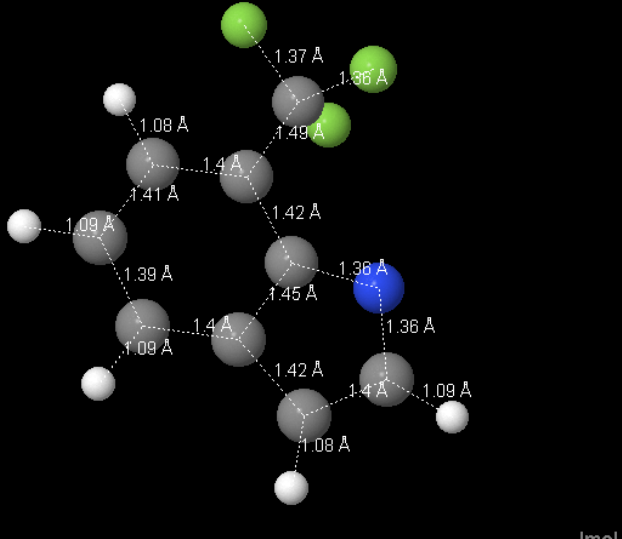
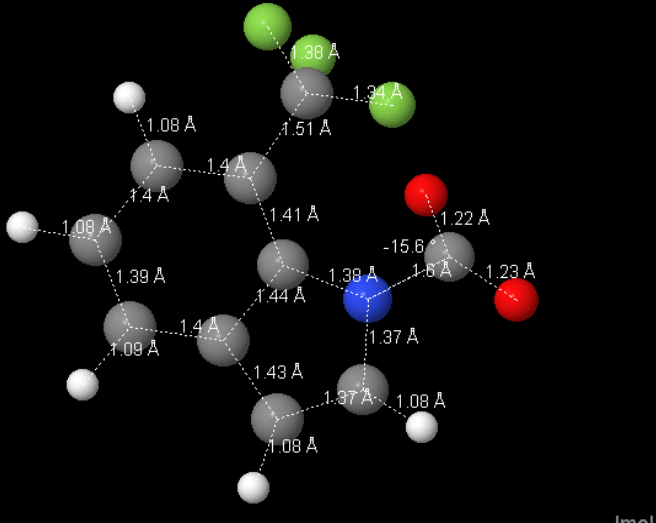
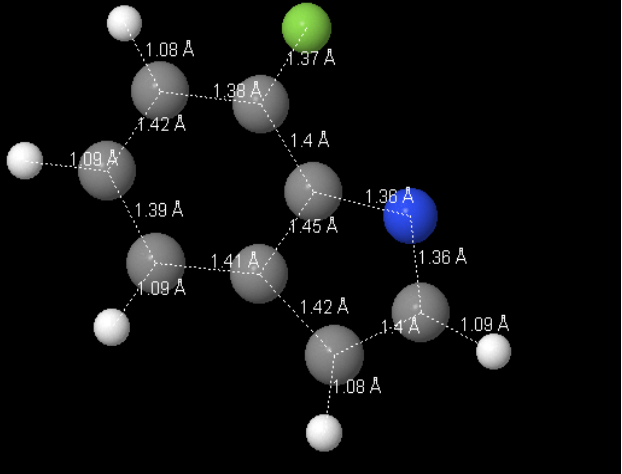
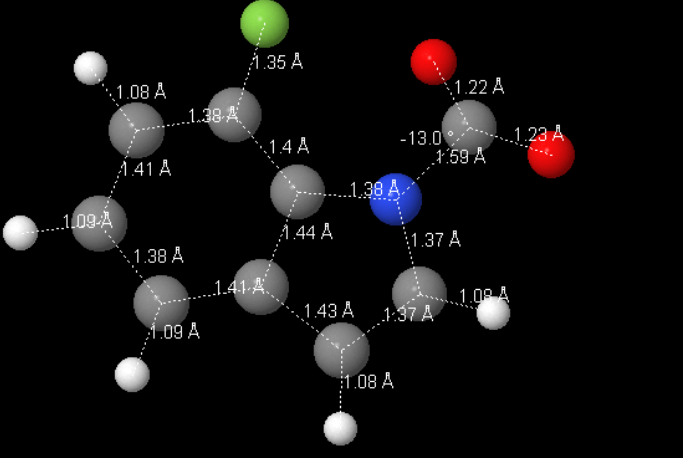
	 ΔH_{rxn} (kJ/mol) -36.9
	 ΔH_{rxn} (kJ/mol) -49.9

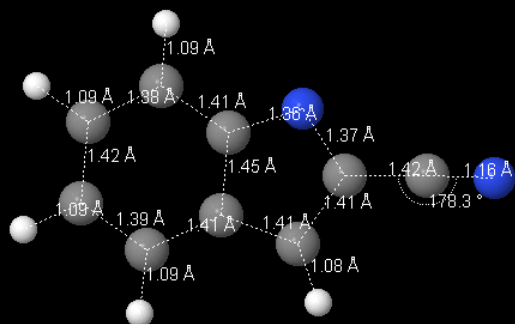
 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -43.1
 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -52.6

 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -24.1
 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -8.6

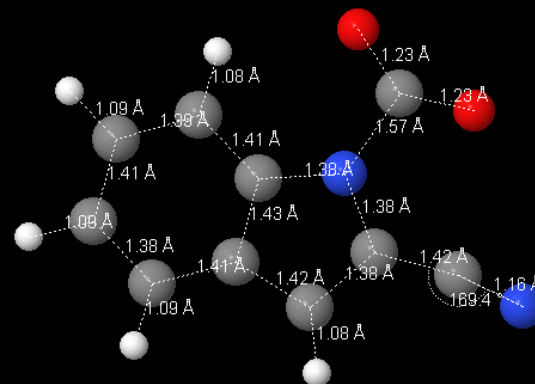
 Jmol	 Jmol ΔH_{rxn} (kJ/mol) -17.9
 Jmol	 Jmol ΔH_{rxn} (kJ/mol) -44.9

 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -64.5
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -56.5

 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -10.5
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -32.8



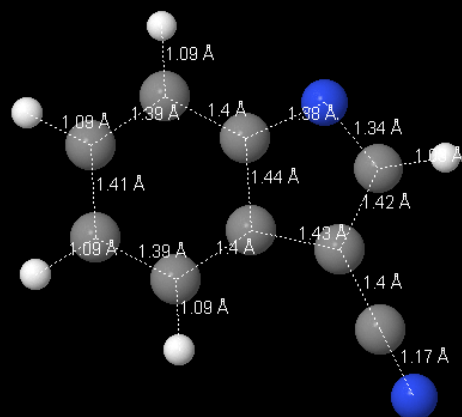
Jmol



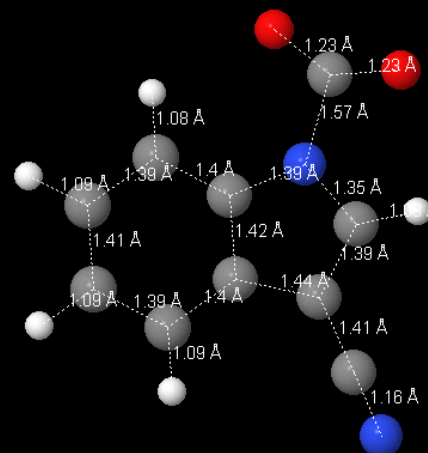
Jmol

$$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$$

-16.7



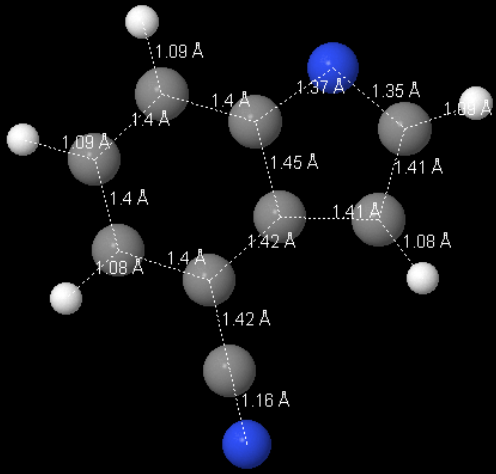
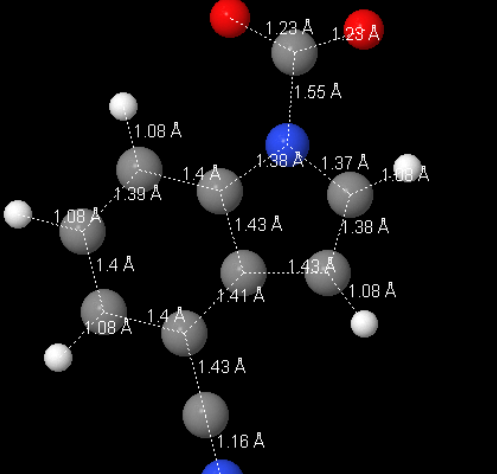
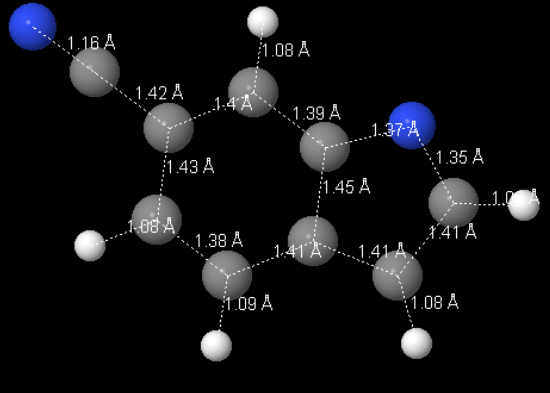
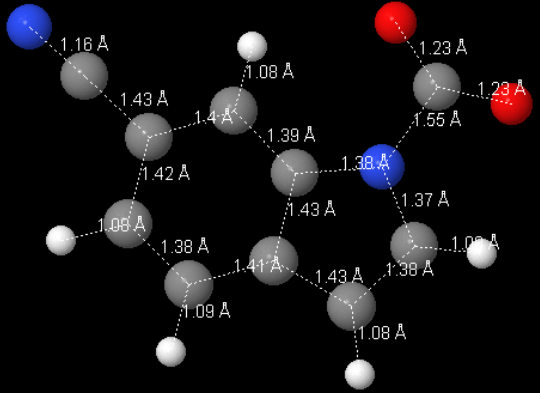
Jmol

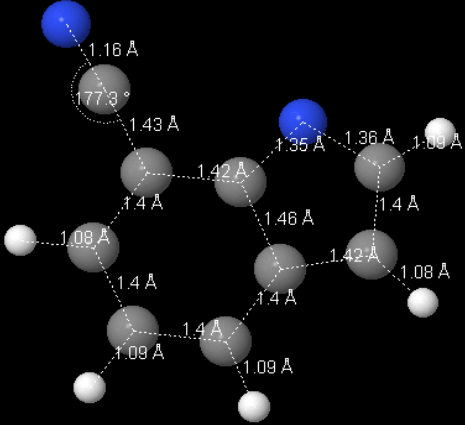
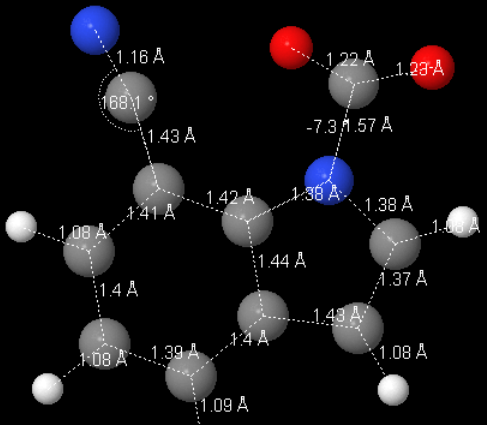
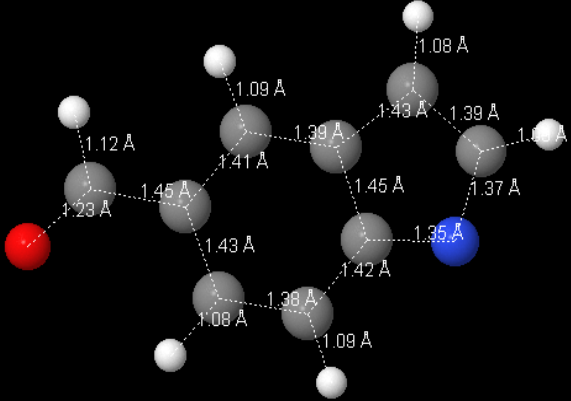
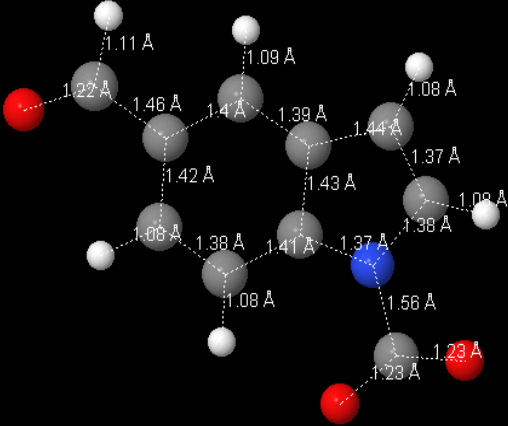


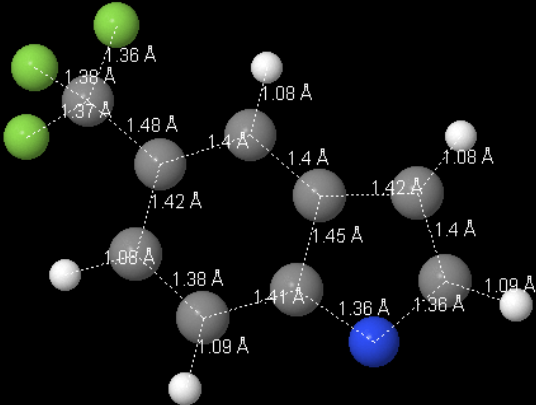
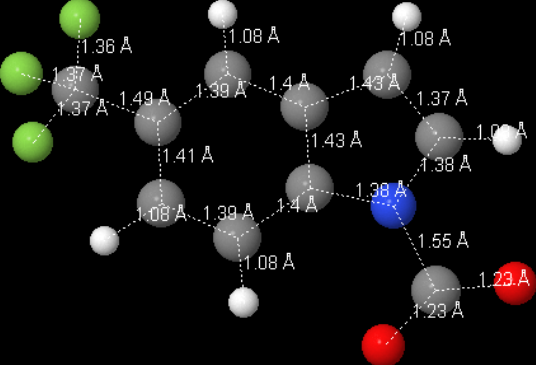
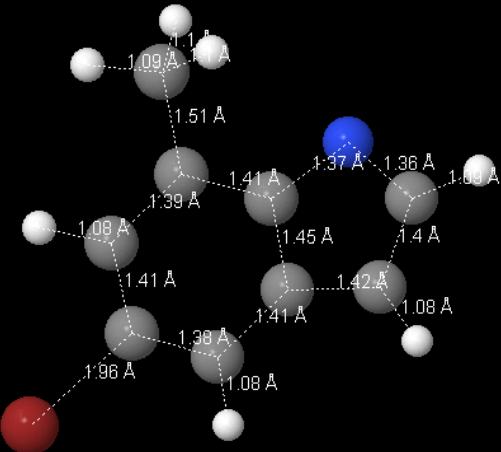
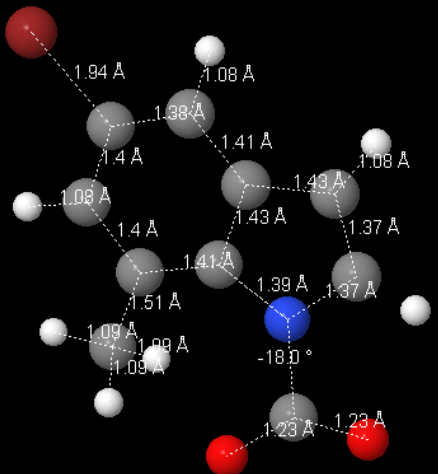
Jmol

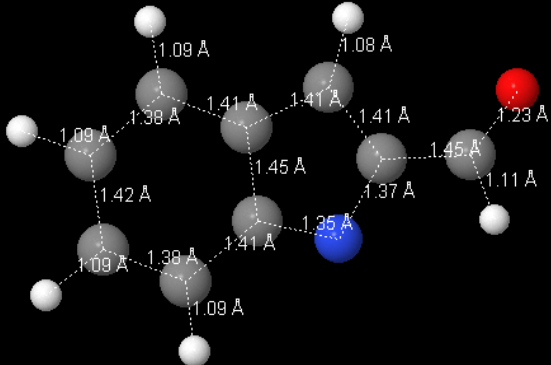
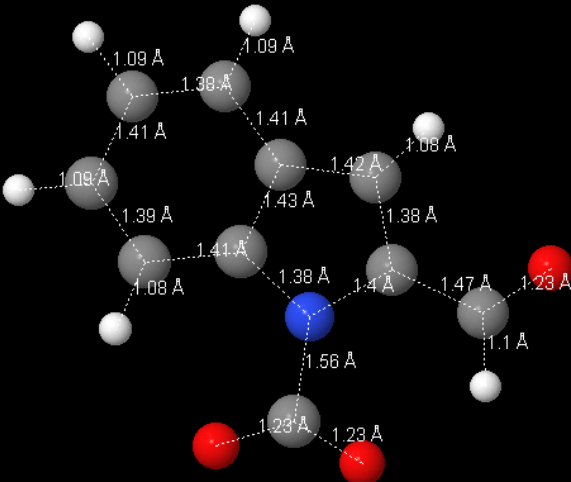
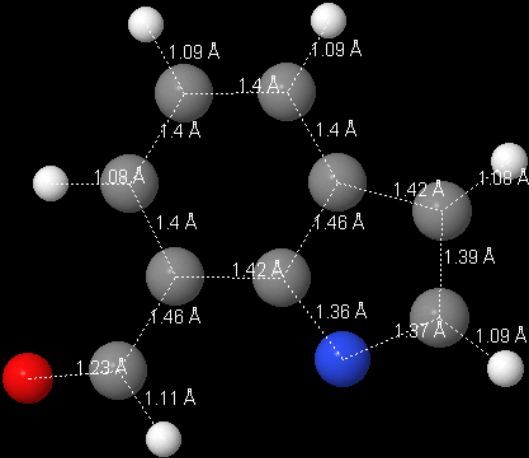
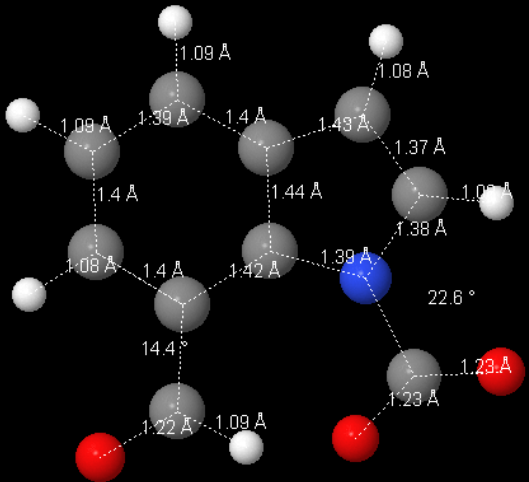
$$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$$

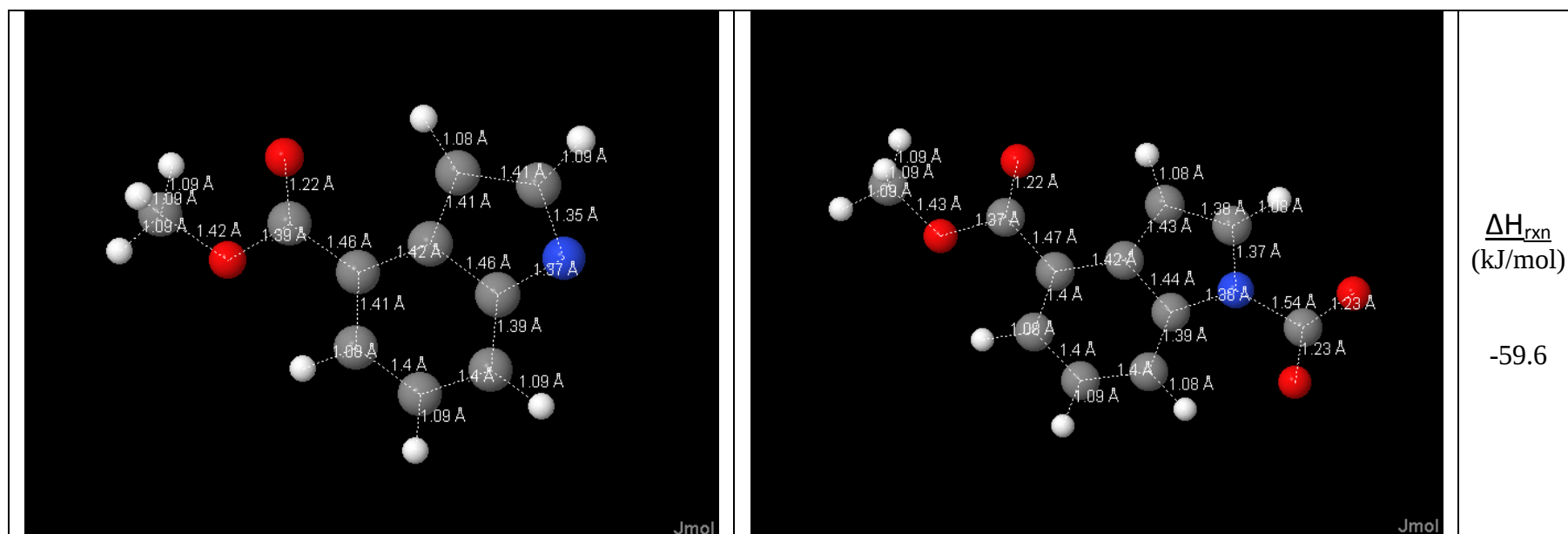
-36.9

 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -52.0
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -46.9

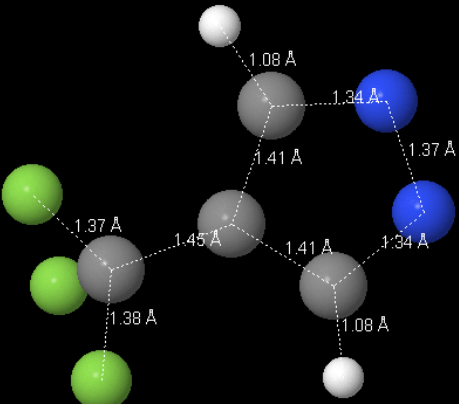
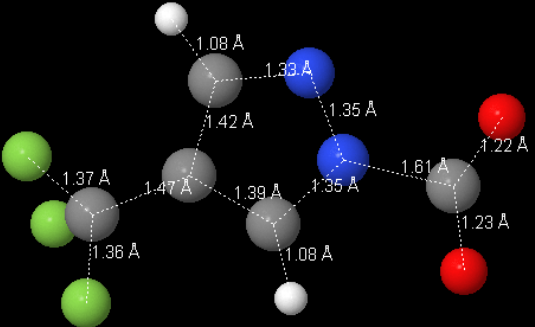
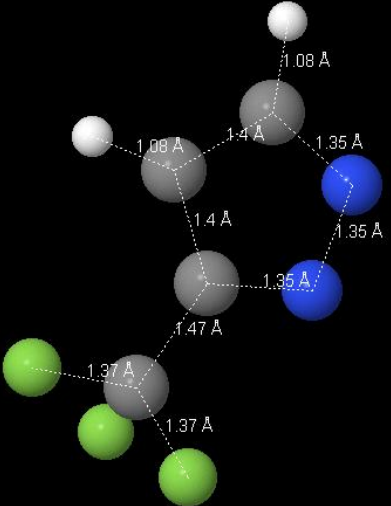
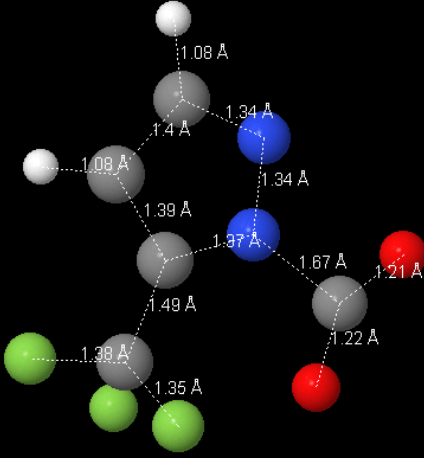
			ΔH_{rxn} (kJ/mol) -14.4
			ΔH_{rxn} (kJ/mol) -48.9

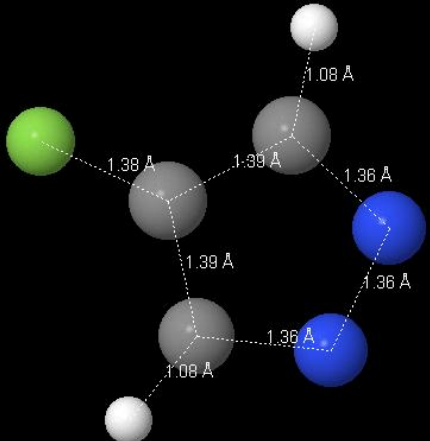
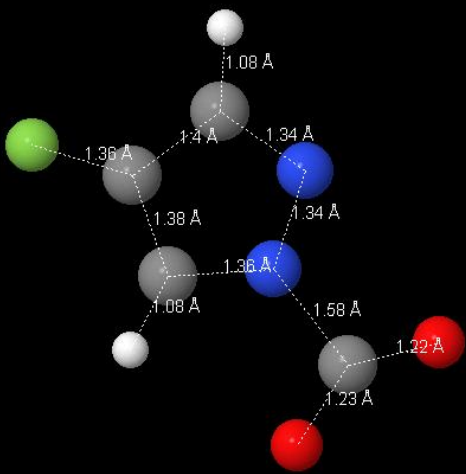
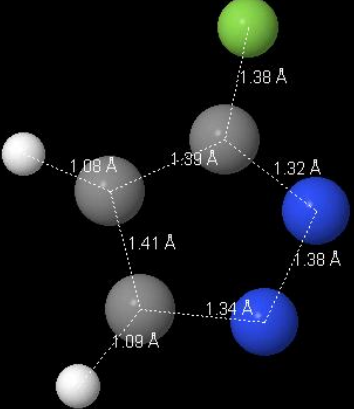
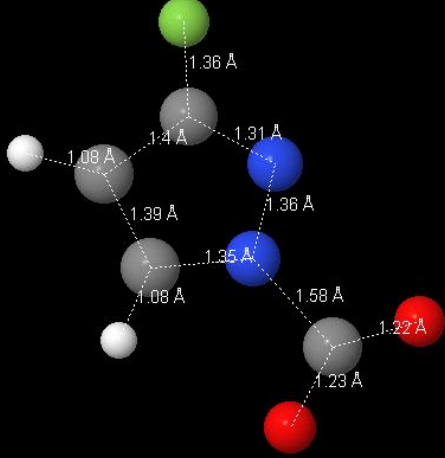
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -55.0
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -36.4

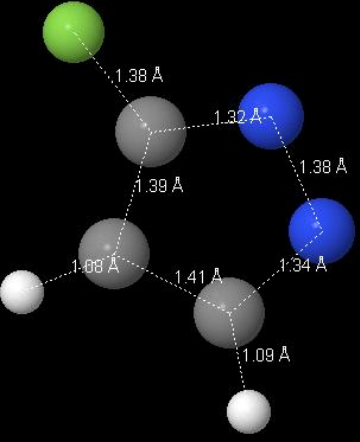
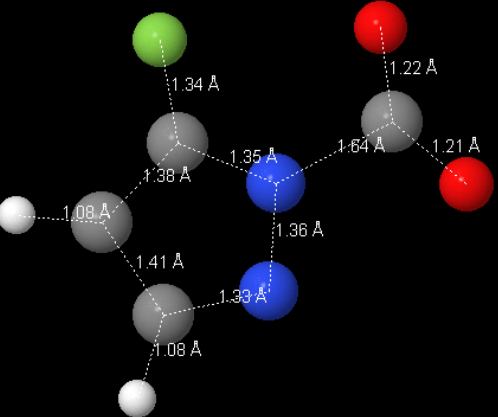
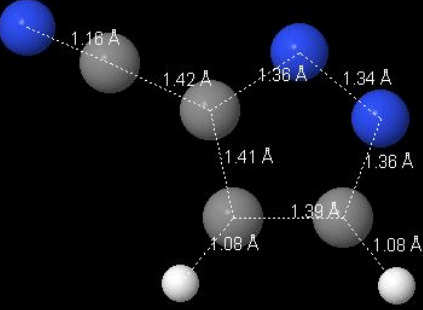
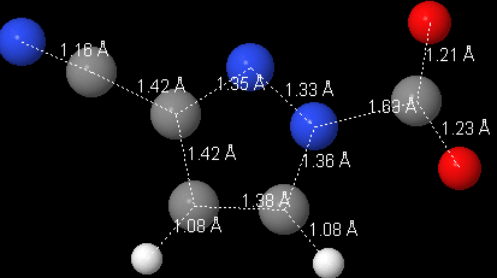
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -25.6
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -27.4

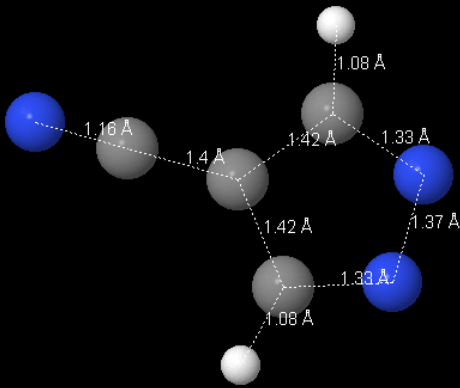
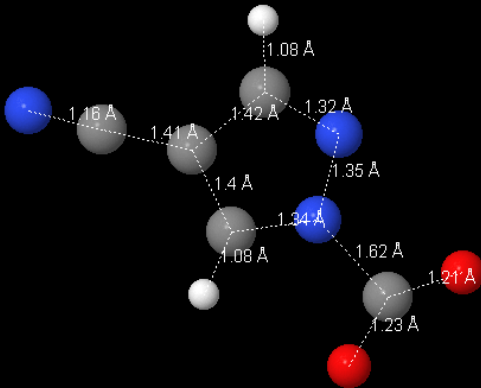
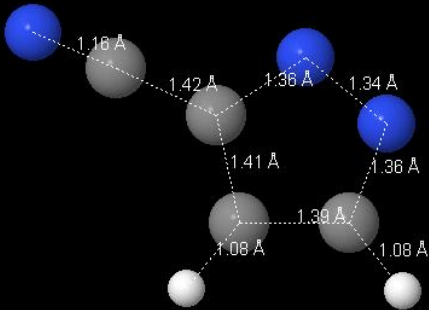
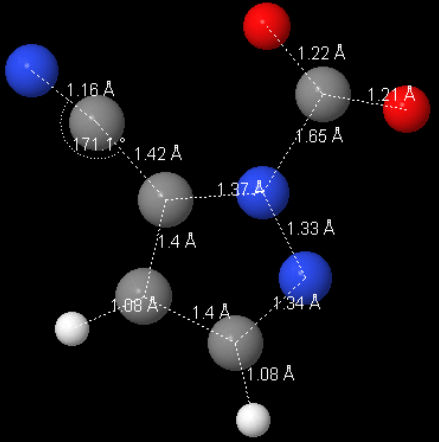


Pyrazolide

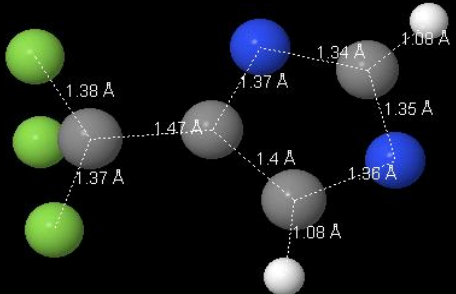
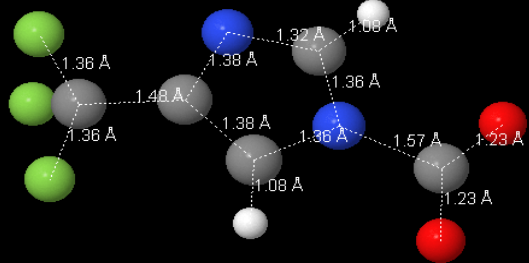
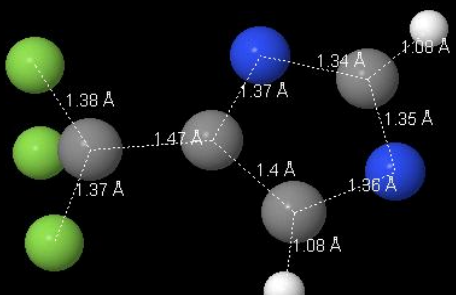
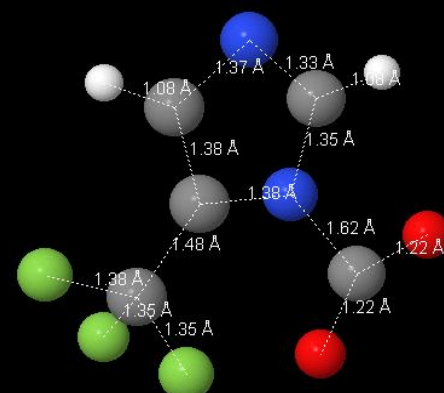
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -43.1
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -11.0

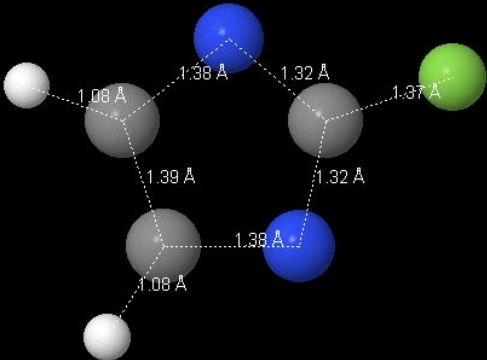
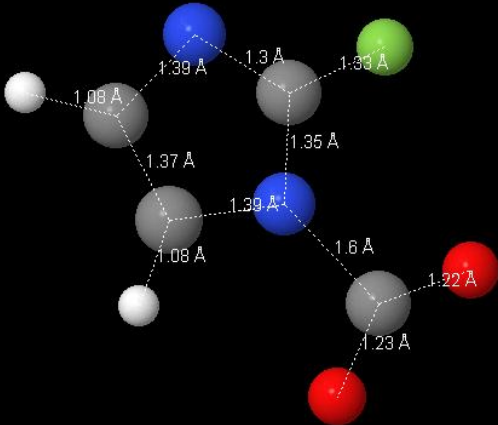
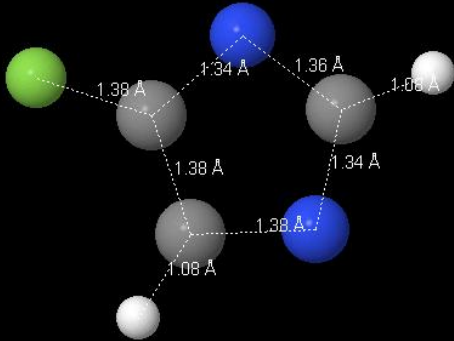
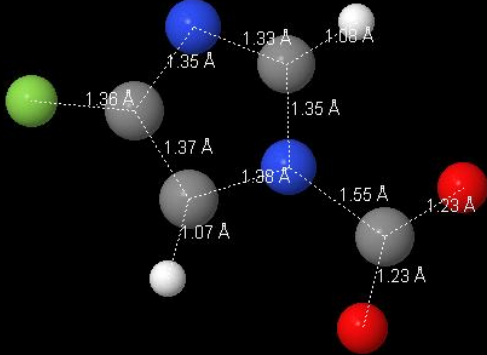
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -66.1
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -63.8

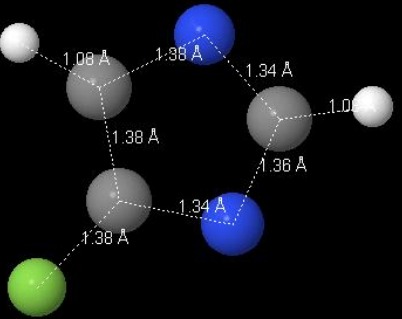
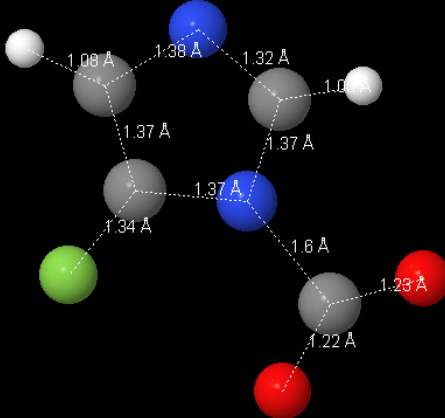
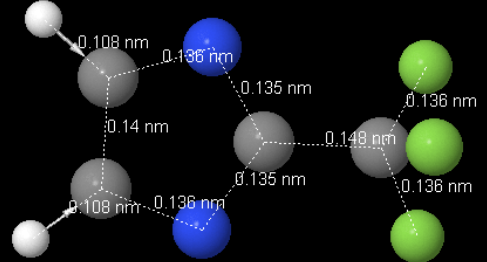
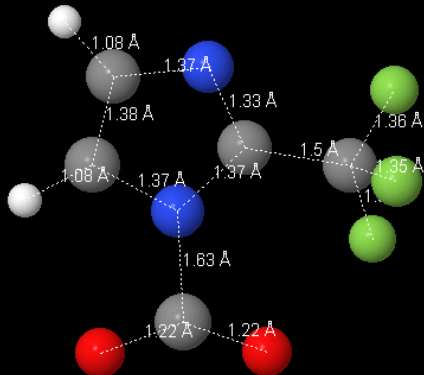
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -27.0
 Jmol	 Jmol	ΔH_{rxn} (kJ/mol) -35.7

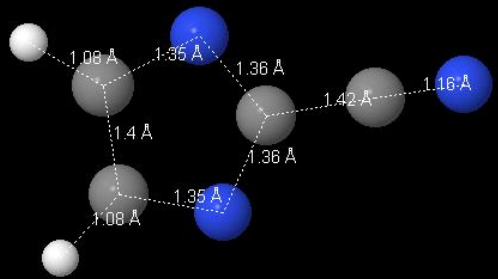
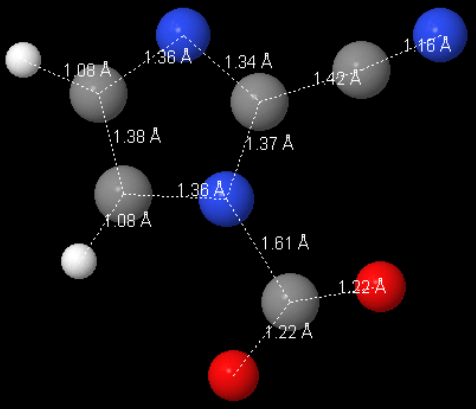
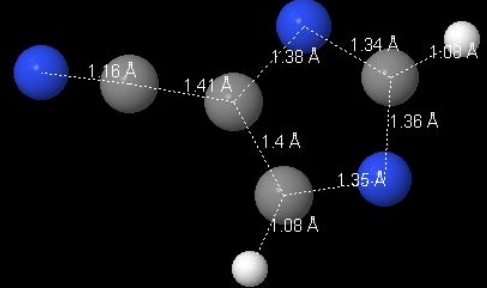
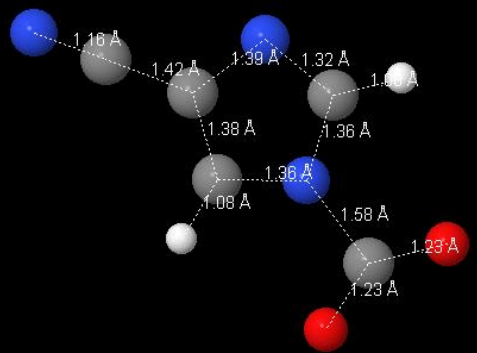
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -35.1
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -12.1

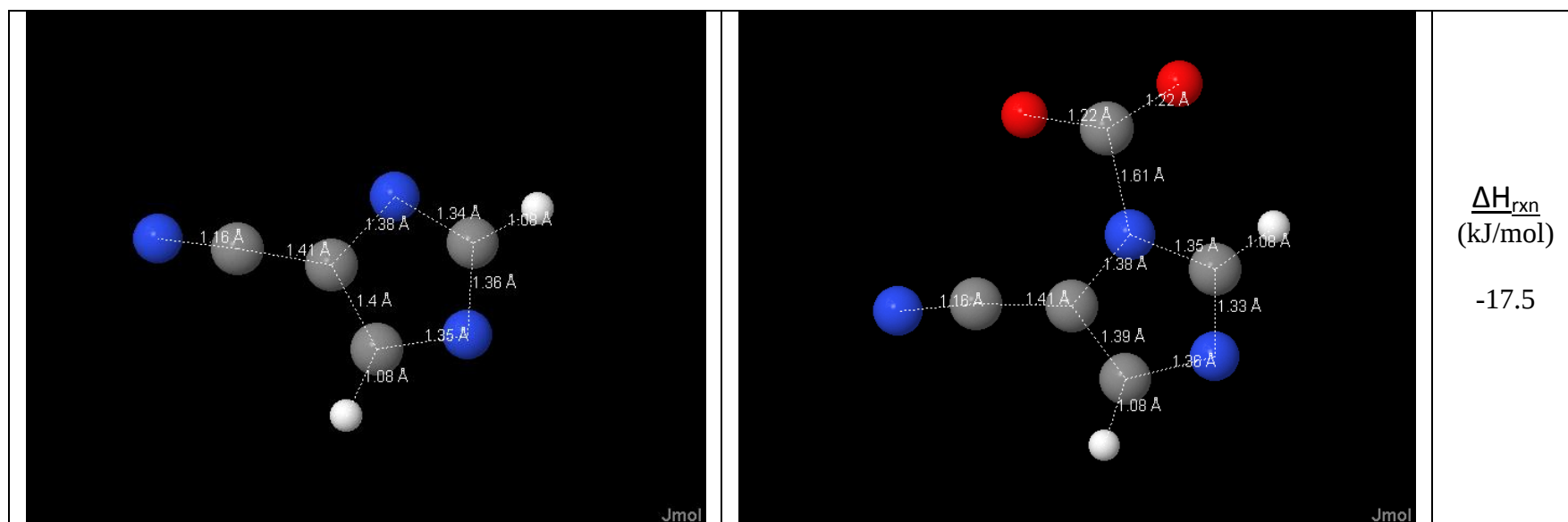
Imidazolidine

 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -48.7
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ 17.0

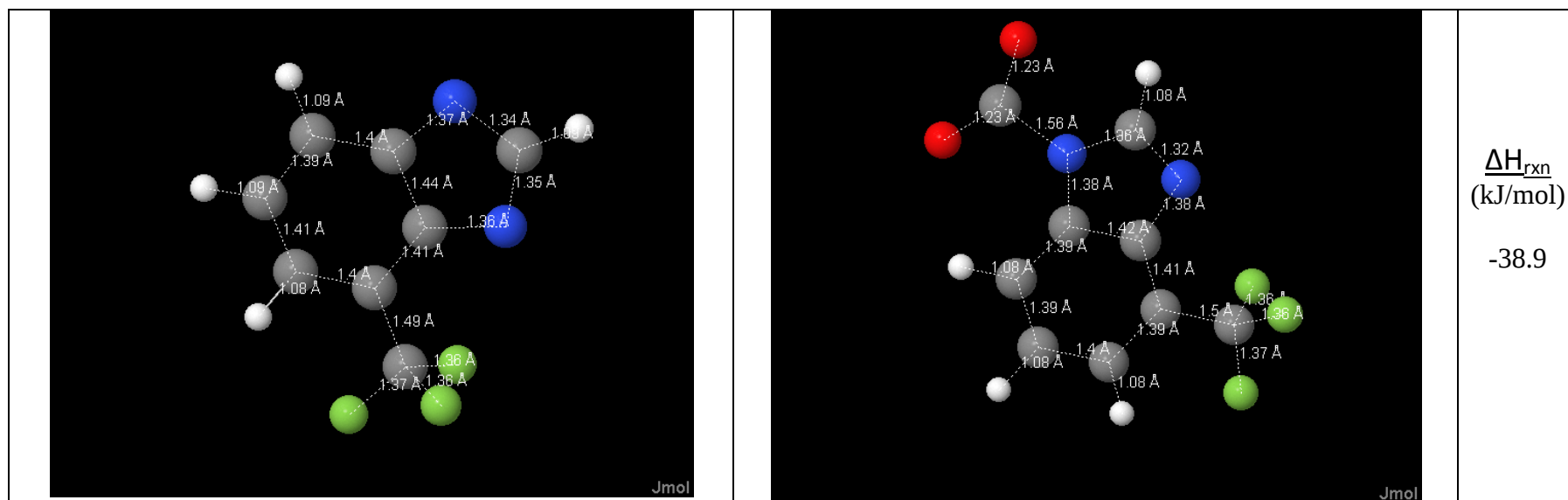
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -35.4
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -67.4

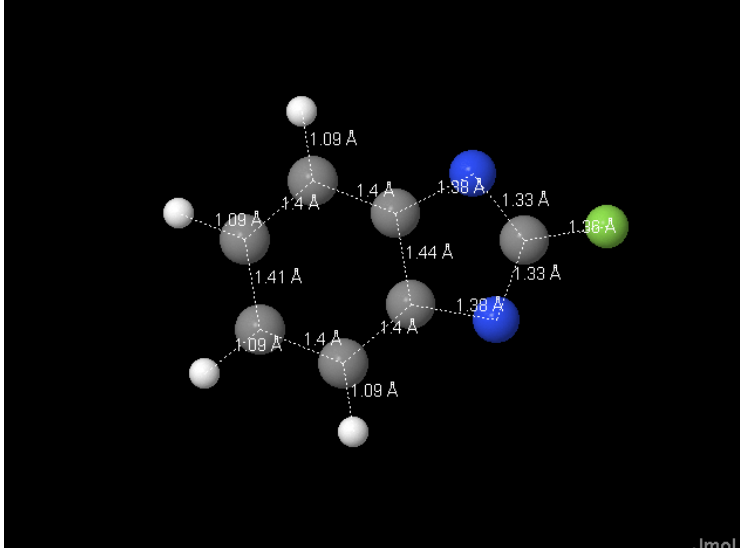
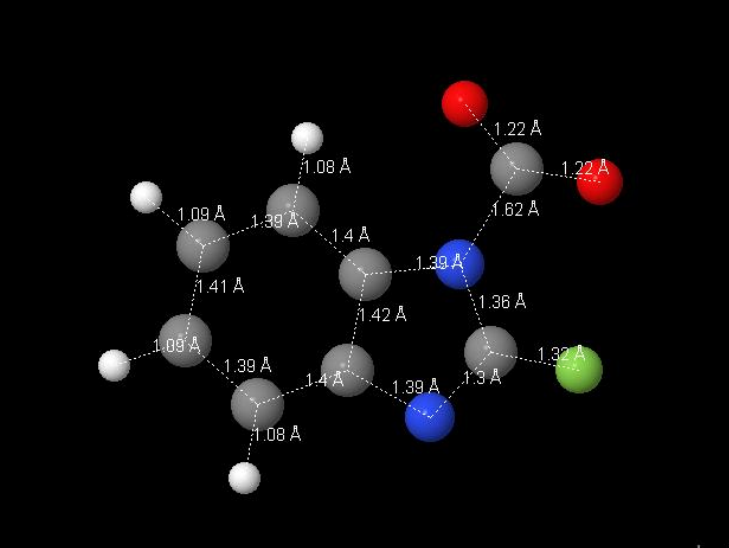
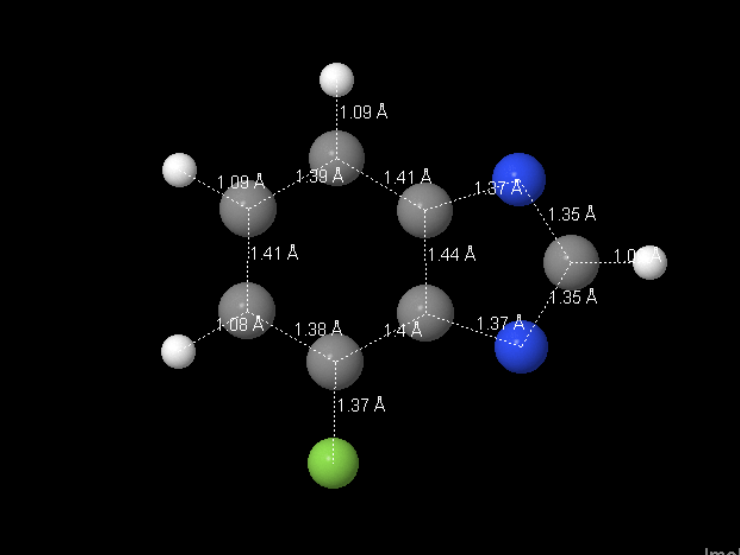
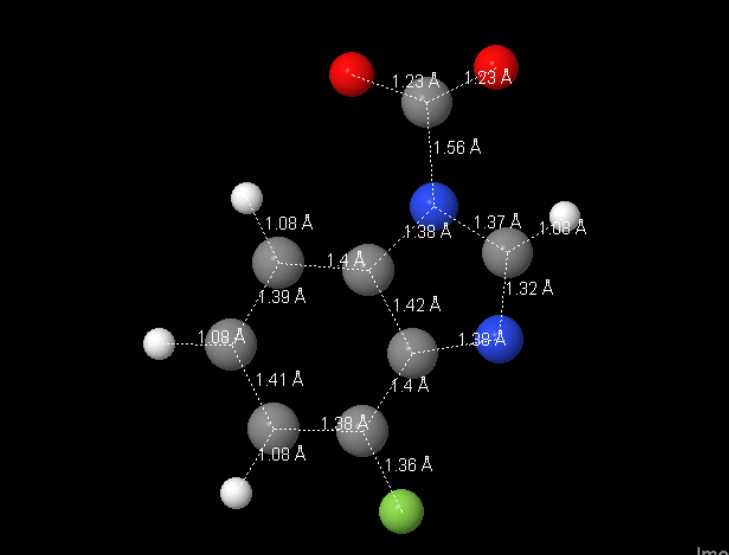
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -30.6
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -15.6

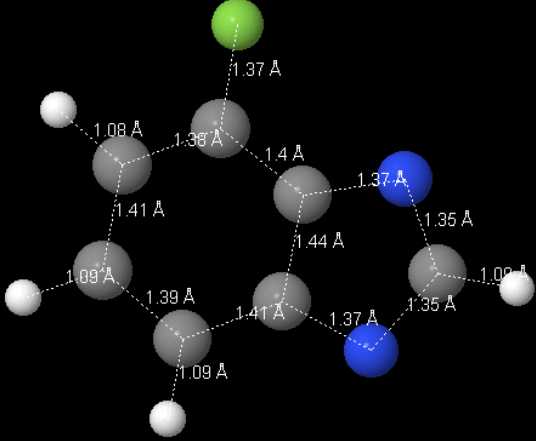
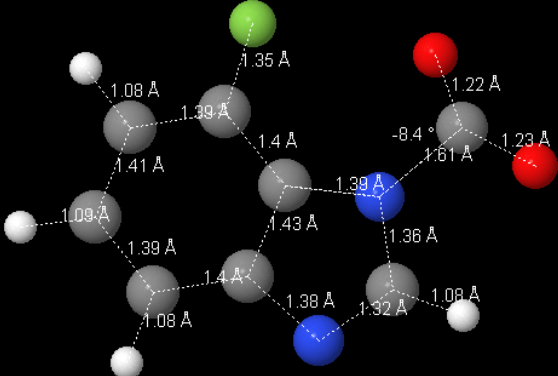
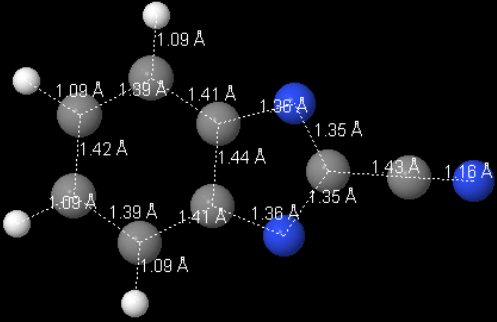
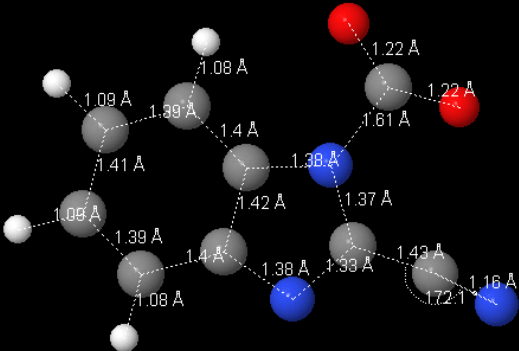
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -16.6
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -40.4

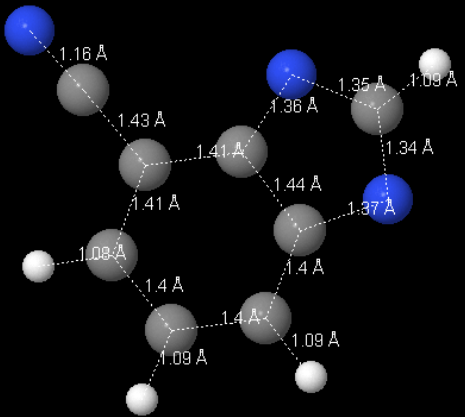
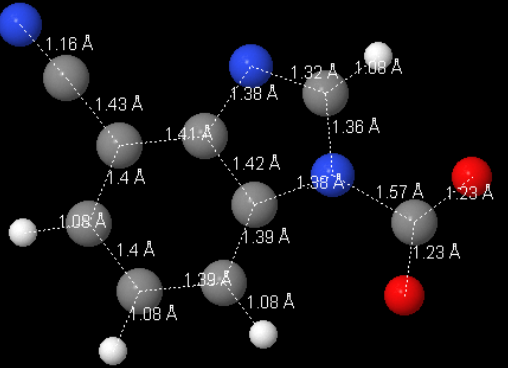
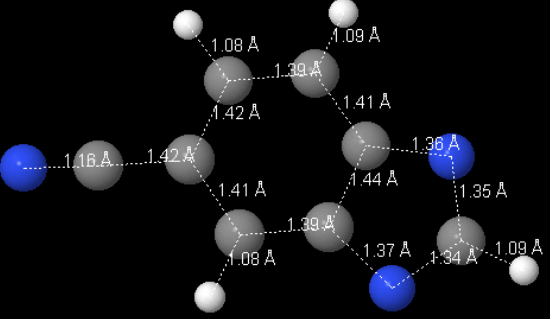
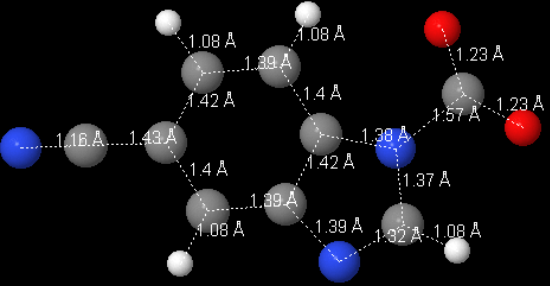


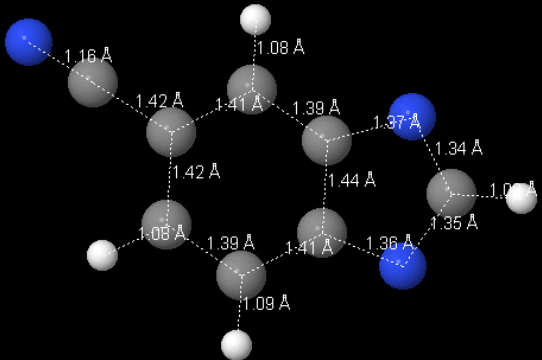
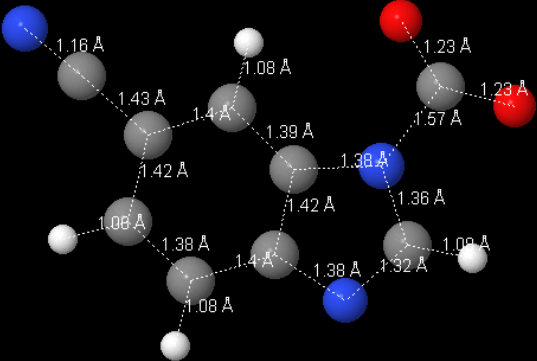
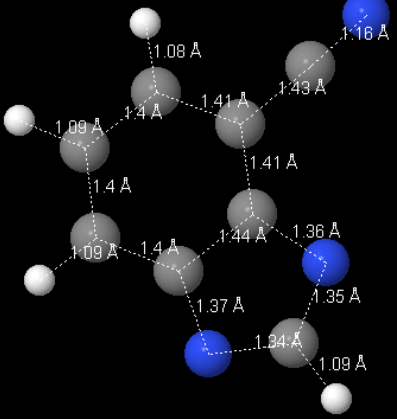
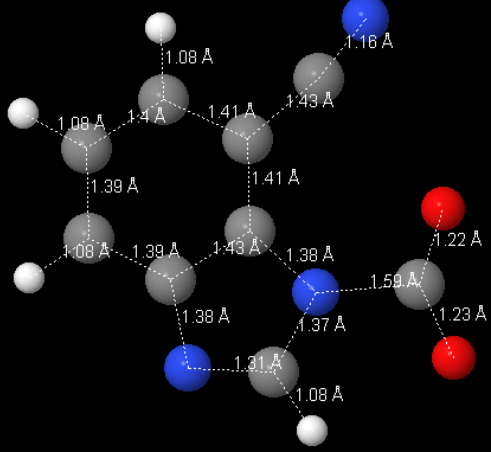
Benzimidazolide

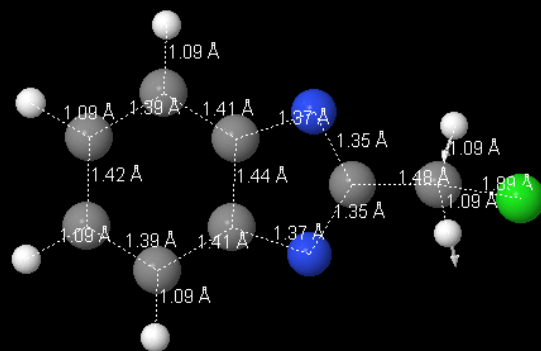


 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -9.7
 Jmol	 Jmol	$\frac{\Delta H_{\text{rxn}}}{\text{(kJ/mol)}}$ -49.6

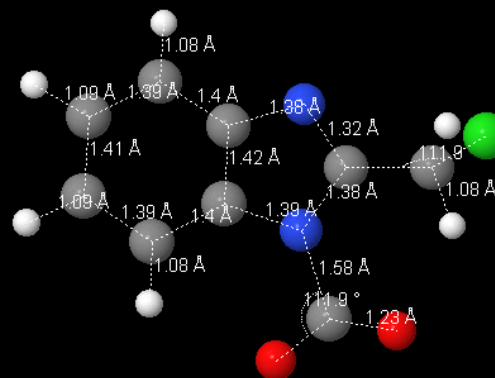
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -19.1
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -1.1

	 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -34.9
	 Jmol		 Jmol	ΔH_{rxn} (kJ/mol) -33.5

 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -30.8
 Jmol		 Jmol	$\frac{\Delta H_{\text{rxn}}}{(\text{kJ/mol})}$ -3.5



Jmol



Jmol

ΔH_{rxn}
(kJ/mol)

-28.4