- Calculate the pH of a solution that is 0.010 M in benzoic acid, $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{COOH}$, and 0.010 M in $\mathrm{C}_{6} \mathrm{H}_{5} \mathrm{CO}_{2} \mathrm{Na}$. The $K_{\mathrm{a}}$ of benzoic acid is $6.4 \times 10^{-5} \mathrm{M}$.


Would this solution make a good buffer system? Give reasons for your answer?


- The gases $\mathrm{NO}_{2}$ and $\mathrm{N}_{2} \mathrm{O}_{4}$ are in equilibrium according to the following equation.

$$
\mathrm{N}_{2} \mathrm{O}_{4}(\mathrm{~g}) \rightleftharpoons 2 \mathrm{NO}_{2}(\mathrm{~g}) \quad \Delta H=+57 \mathrm{~kJ} \mathrm{~mol}^{-1}
$$

In which direction will the reaction move when the following changes are made?
The pressure is increased by decreasing the volume.
$\square$

