

MIDTERM EXAM IN
CHEM 121
(CHEMISTRY FOR ENGINEERS)

Test I: What is the oxidation number of nitrogen in each of the following (2 points each)



$$\begin{aligned} \text{N} + 4(1) + (-1) + 2(-2) &= 0 \\ \text{N} + 4 - 1 + 4 &= 0 \\ \text{N} - 1 &= 0 \\ \mathbf{\text{N} = 1} & \end{aligned}$$



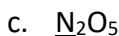
$$\begin{aligned} 2\text{N} + 4(-2) &= 0 \\ 2\text{N} - 8 &= 0 \\ 2\text{N} &= 8 \\ \mathbf{\text{N} = 4} & \end{aligned}$$



$$\begin{aligned} 1 + \text{N} + 3(-2) &= 0 \\ 1 + \text{N} - 6 &= 0 \\ \text{N} - 5 &= 0 \\ \mathbf{\text{N} = 5} & \end{aligned}$$



$$\begin{aligned} 2\text{N} + 4(1) + 2(-2) + 3(-2) &= 0 \\ 2\text{N} + 4 - 4 - 6 &= 0 \\ 2\text{N} &= 6 \\ \mathbf{\text{N} = 3} & \end{aligned}$$



$$\begin{aligned} 2\text{N} + 5(-2) &= 0 \\ 2\text{N} - 10 &= 0 \\ 2\text{N} &= 10 \\ \mathbf{\text{N} = 5} & \end{aligned}$$



$$\begin{aligned} \text{N} + 3(1) &= 0 \\ \text{N} + 3 &= 0 \\ \mathbf{\text{N} = -3} & \end{aligned}$$



$$\begin{aligned} 2\text{N} + 4(1) + 2 + (-2) &= 0 \\ 2\text{N} + 4 + 2 - 2 &= 0 \\ 2\text{N} &= -4 \\ \mathbf{\text{N} = -2} & \end{aligned}$$



$$\begin{aligned} 3 + 12(1) + 3\text{N} + 3(-2) &= 0 \\ 15 + 3\text{N} - 6 &= 0 \\ 9 + 3\text{N} &= 0 \\ 3\text{N} &= -9 \\ \mathbf{\text{N} = -3} & \end{aligned}$$



$$\begin{aligned} 3(1) + \text{N} &= 0 \\ 3 + \text{N} &= 0 \\ \mathbf{\text{N} = -3} & \end{aligned}$$



$$\begin{aligned} 1 + \text{N} + 2(-2) &= 0 \\ 1 + \text{N} - 4 &= 0 \\ \text{N} - 3 &= 0 \\ \mathbf{\text{N} = 3} & \end{aligned}$$

Test II: Fill in the blanks with formula of compounds composed of the indicated positive and negative ions. (30 points)