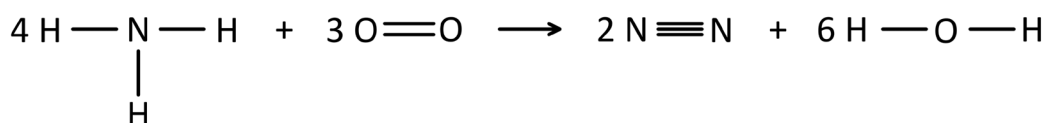


Name:

Class:



Ammonia reacts with oxygen in the presence of a metal oxide catalyst to produce nitrogen and water. The figure below shows the displayed formula equation for the reaction.



The table below shows the bond energies.

Bond	N – H	O = O	N ≡ N	O – H
Bond energy in kJ/mol	391	498	945	464

Calculate the overall energy change for the reaction.

$$\Delta H = \text{Energies of reactants} - \text{Energies of products}$$

$$\Delta H = 4[3(391)] + 3(498) - (2(945) + 6[2(464)])$$

$$\Delta H = 4692 + 1494 - (1890 + 5568)$$

$$\Delta H = 6186 - 7458 = -1272$$

$$\text{Overall energy change} = -1272 \text{ kJ}$$

What is the functional group of carboxylic acids?

COOH

State the general formula of an alkane.

C_nH_{2n+2}

Complete the equation for the cracking of dodecane by filling in the formula of the single molecule needed to balance the equation.



What is the functional group of alcohols?

OH or hydroxyl group

Give the electronic configuration of a sodium **ion**.

2, 8

Solid X contains two ions.

Test	Result
Flame test on solid X	Red-orange flame
Dilute nitric acid is added to an aqueous solution of X, followed by silver nitrate solution.	White precipitate forms

Use the information above to name the cation and the anion in solid X.

Cation: **Calcium/ Ca²⁺**

Anion: **Chloride/ Cl⁻**

State the general formula of an alkene.

C_nH_{2n}

Give the formula of aluminium oxide.

Al₂O₃