Stoichiometric Ratio

The stoichiometric ratio between two reactants will be determined experimentally.

Principles

Stoichiometry is the branch of chemistry that deals with the ratio between reactants and products in a chemical reaction.

The net result can be described by a balanced chemical reaction.

Principles

This balanced equation gives us valuable information about the reaction.

$$Mg_{(s)} + 2HCl_{(aq)} \longrightarrow MgCl_{2(aq)} + H_{2(g)}$$

Principles

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1Mg to 2 HCl

3 Reactants to 2 Products

1 Mg to 1 $MgCl_2$

2 HCl to 1 $MgCl_2$

Principles

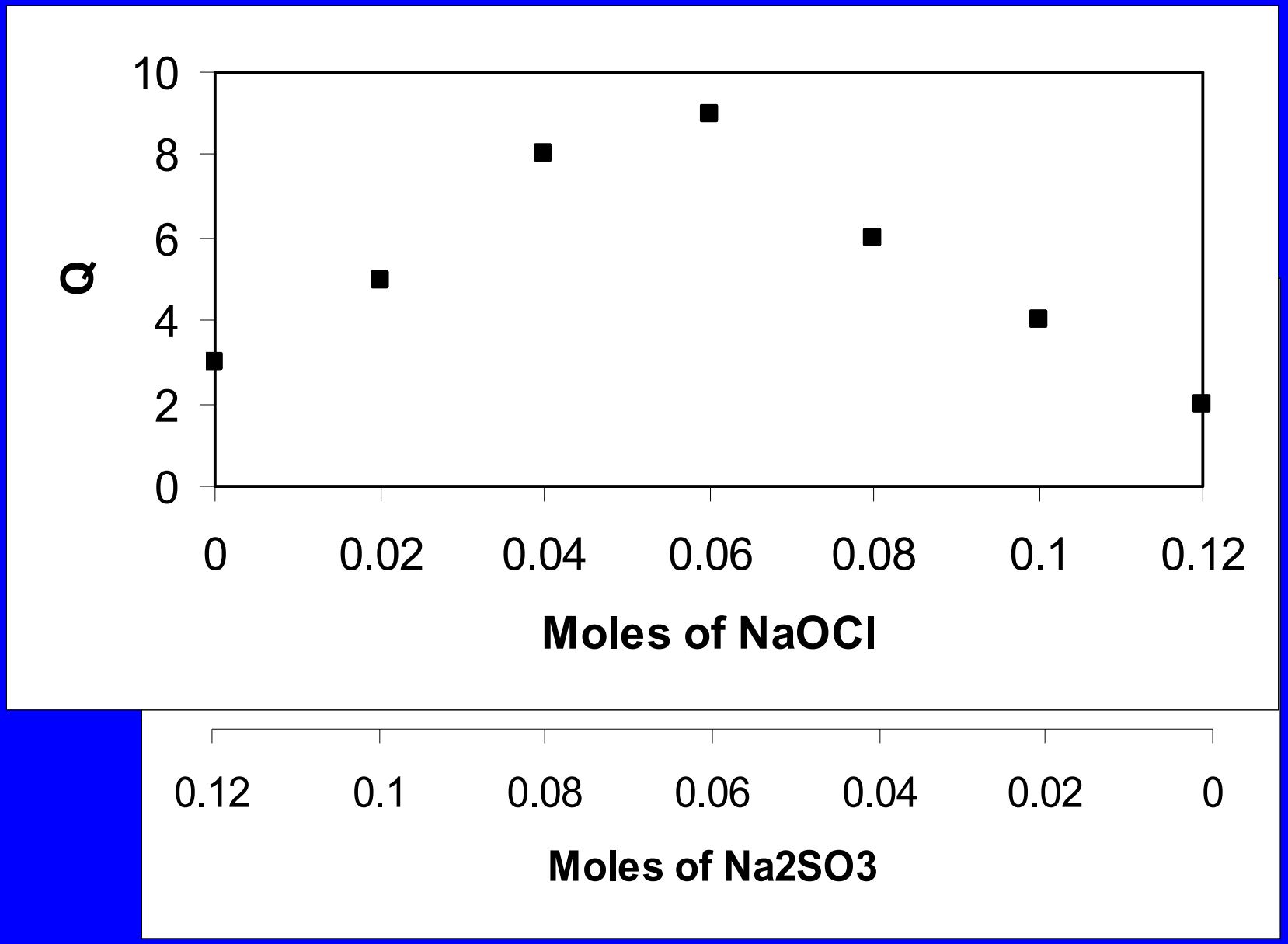
In this Lab we will use the heat given off by a reaction to determine its stoichiometry.

$$a\ Na_2SO_{3(aq)} + b\ NaOCl_{(aq)} \longrightarrow \text{products} + \text{heat}$$

Principles

The amount of heat given off, or Q, can be graphed versus the number of moles of reagent.

From the graph the stoichiometry can be determined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Moles of NaOCl
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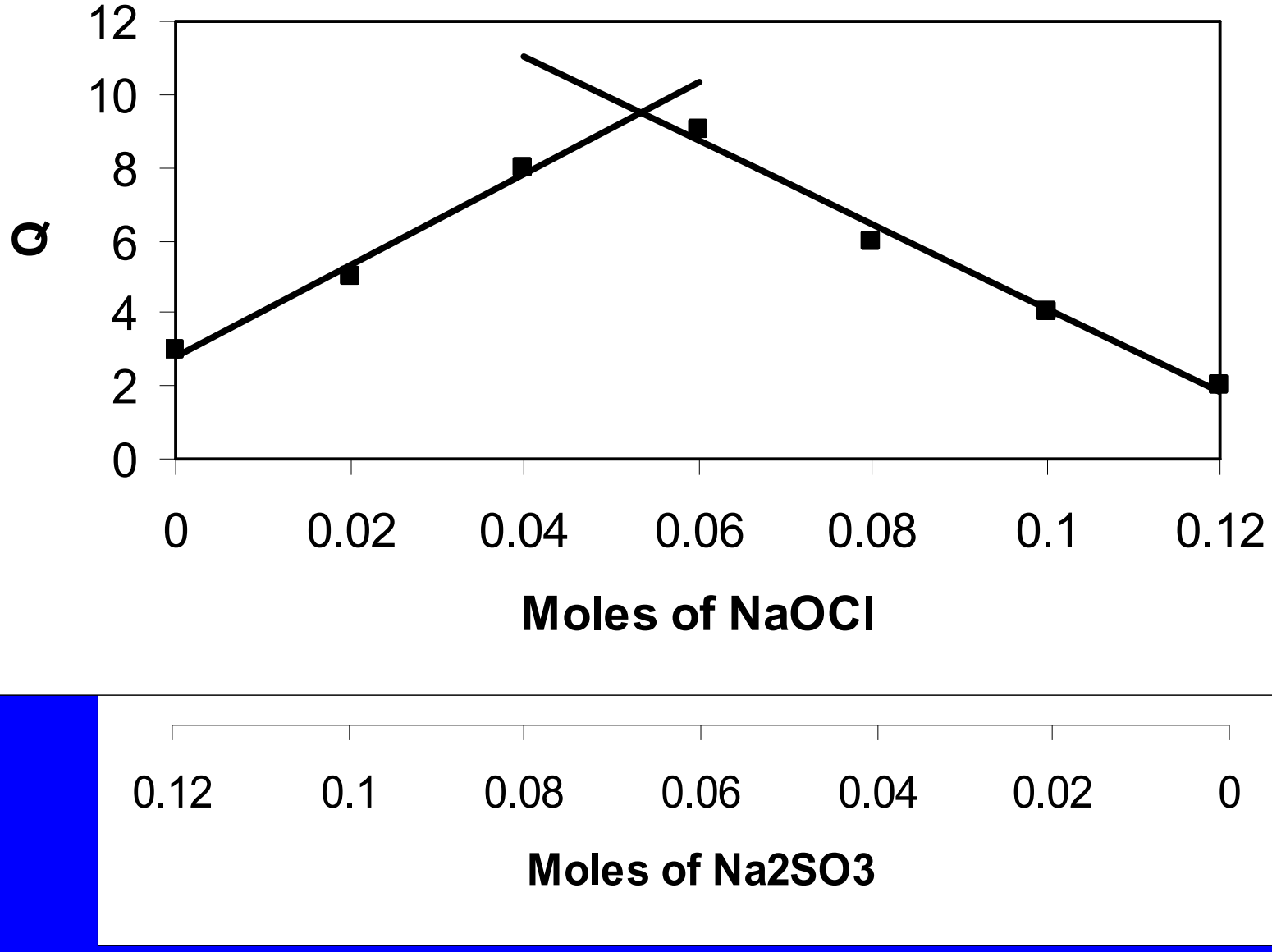
Moles of Na2SO3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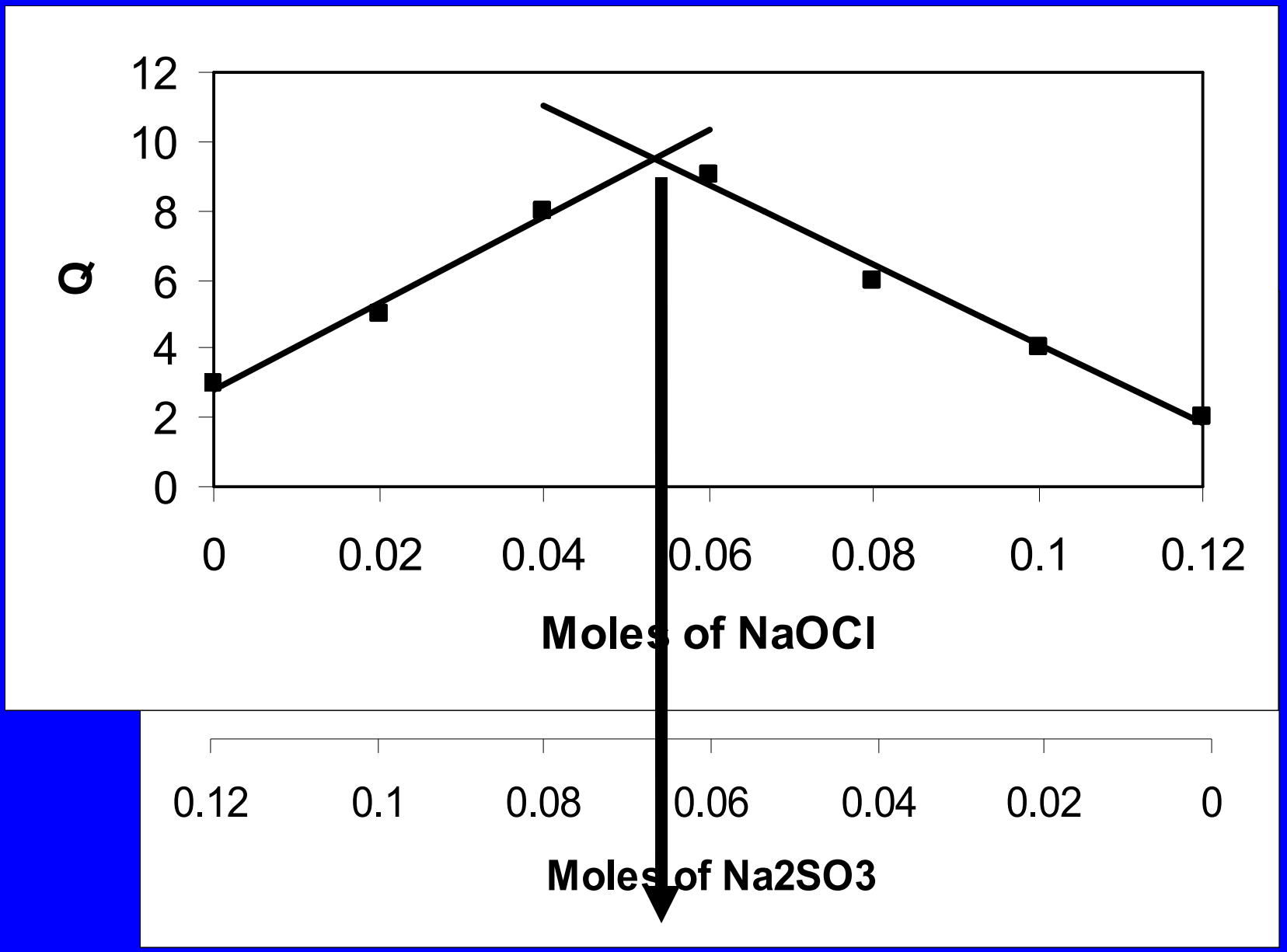
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Calculations

Number of moles of reactant:

Moles = M V Moles = (0.5mol/L)(0.010L)

Change in Temperature:

$\Delta T = T_f - T_i$ $\Delta T = 32^oC - 23^oC$

Procedure

Measure appropriate amounts of NaOCl and Na_2SO_3

Determine the temperatures of both reagents.

Do Not use the same thermometer for both reagents

Procedure

Pour the NaOCl into a clean styrofoam cup.

Add the Na_2SO_3 and record the maximum temperature that the mixture reached.

Ensure that the reagents are well mixed

Safety

- It is important that you always keep your safety goggles on.