Discussion:

Assumptions made in this experiment were that the system was isolated and that no extra heat from the surroundings could have an effect on the reaction (which is why the calorimeter was also placed in a beaker of ice. It was also assumed that the change in enthalpy of the ice is equivalent to the change of enthalpy for the reaction.

$Mg(s) + 2H_3O^+(aq) \rightarrow Mg^{2+}(aq) + H_2(g) + 2H_2O(l)$

To find the change of enthalpy of reaction $\Delta H_{surrounding} = -\Delta H_{system}$ was used. Using the calorimeter, the volume change could be found once the exothermic reaction melted the ice. Ice has a lower density than water, so it occupies greater volume (density is inversely related to volume). By measuring the change in volume, the mass of ice that melted could be found, allowing us to change in enthalpy of ice.

Sources of error in this lab could have been the air bubbles in the calorimeter, outside heat, and perhaps an incomplete reaction. Small pieces of ice were used in the calorimeter, leaving spaces between them which were filled with water. This was stirred to minimize air bubbles but some bubbles could have remained. This would have external heat to affect the change in volume. When external heat has an affect, ice may melt, lowering the volume more than the heat of reaction would. This could also happen if the isolating beaker of ice had air bubbles or if they were handled too much. Also, the reaction might not have completed, which would give a lower enthalpy.

conclusion

The change of the enthalpy of reaction was -168 kJ/mol.