



Background information

Some reactions are used in hand warmers. Other reactions are used in 'instant' cold packs to treat sports injuries. Each card at the bottom of this sheet contains information about a reaction that might be used for one of these purposes.

Your task

- Cut out the cards.
- Sort the cards into two piles:
 - one pile with cards about a reaction that could be used in a hand warmer
 - one pile with cards about a reaction that could be used in a cold pack.
- Organise each pile so that it tells you, in order:
 - the word equation and balanced equation for the reaction
 - why the reaction might be used for a hand warmer or for a cold pack
 - how the reaction is started, and any extra substance needed for the reaction to happen
 - what is left behind at the end of the reaction, and any problems that might cause.
- Use your two organised piles to write a paragraph, small leaflet or poster about each reaction and its possible use. Include any reasons that explain why the reaction might *not* be suitable for that use.

Information cards

A cold corrosive slush is left at the end.	Sodium chloride and water are included to speed up rusting.
$4\text{Fe(s)} + 3\text{O}_2\text{(g)} \rightarrow 2\text{Fe}_2\text{O}_3\text{(s)}$	The reaction is started by opening an airtight container.
A hot powder similar to rusted iron is left at the end.	The reaction mixture reaches $-25\text{ }^{\circ}\text{C}$.
The reaction gives out heat energy to the surroundings.	Ammonia gas is toxic and causes skin burns.
The reaction is endothermic .	barium hydroxide + ammonium thiocyanate \rightarrow barium thiocyanate + water + ammonia
The reaction mixture reaches $40\text{ }^{\circ}\text{C}$.	iron + oxygen \rightarrow iron(III) oxide
The reaction takes in heat energy from the surroundings.	The reaction is exothermic .
$\text{Ba(OH)}_2\text{(s)} + 2\text{NH}_4\text{SCN(s)} \rightarrow \text{Ba(SCN)}_2\text{(s)} + 2\text{H}_2\text{O(l)} + 2\text{NH}_3\text{(g)}$	The reaction is started by mixing the solids together.