



HEAT PACK REVOLUTION

~Fireworks Production Using Heat Pack~

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Introduction

Disposable heat packs can be repurposed, but not many people actually do.
We'd like to propose a new way to reuse them.

Hypothesis

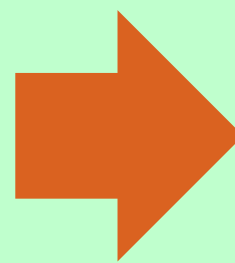
We can make handheld fireworks from the contents of used heat packs.

Experiments and Results

※: heat pack materials

1.reducing HP ※

tried to reduce iron oxide in a HP to iron
(1)used a microwave oven (reference①)
(2)used a gas burner

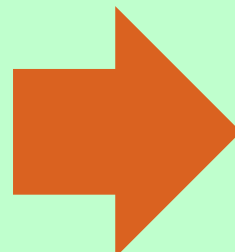


(1)reacted,but dangerous
(2)succeeded,but it was difficult to separate other substances

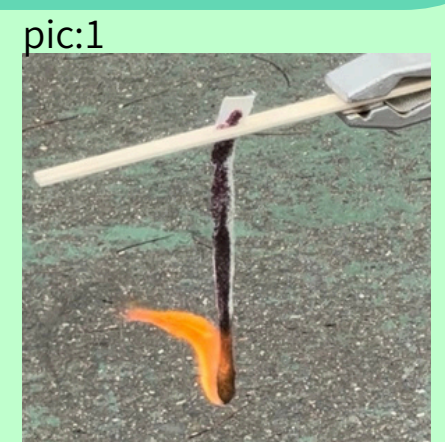
✗ failed

2.making fireworks without reduction

started making fireworks without reducing HP
• combined fabric, a small amount of used HP, and lip balm as glue



saw sparks,
but burned too much



○visiting a fireworks factory

visited KOYAMA HANABI Co. in October • received advice and materials for fireworks

3.remaking fireworks

made 8 kinds of fireworks

• oxidizer

(a)HP

(b)KClO₄

(c)KNO₃(HP×1.5)

(d)KNO₃(HP×2)

• wrapping paper

(1)washi

(2)tissue paper

→(b.1) worked well

pic:2



succeeded

table:A

		oxidizing agent (g)			
z		(a)	(b)	(c)	(d)
others(g)	S	0.300	0.300	0.300	0.300
	C	0.400	/	/	/
	KCl	0.200	0.200	0.200	0.200
	Ti	0.300	/	/	/
	HP	2.50	0.700	1.40	1.05
	KNO ₃	/	/	1.00	1.00
	KClO ₄	/	1.00	/	/

Conclusions

Discussions

- heat packs → iron powder,carbon
- wrapping and twisting heat pack
→ important to keep the fire source stable

Outlook for the future of research

- create fireworks considering safety

References and Acknowledgement

- ① https://www.jstage.jst.go.jp/article/kakyoshi/52/3/52_KJ00007743794/_article/-char/ja/
② <https://omizu-water.hatenablog.com/entry/2022/01/08/190000>
③ [KOYAMA HANABI CO.](#)