



# HEAT PACK REVOLUTION

## ~Fireworks Production Using Heat Pack~

Hirano Senior High School attached to Osaka Kyoiku University

### 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

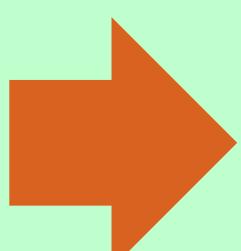
We can make handheld fireworks from the contents of used heat packs.

### 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



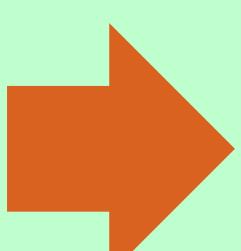
(1) reacted, but dangerous

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

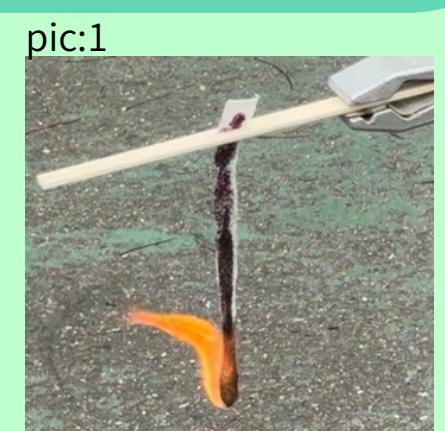
failed

#### 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)  $\text{KClO}_4$

(c)  $\text{KNO}_3$  (HP × 1.5)

(d)  $\text{KNO}_3$  (HP × 2)

• wrapping paper

(1) washi

(2) tissue paper

→ (b.1) worked well

pic:2



succeeded

table:A

z		oxidizing agent (g)			
		(a)	(b)	(c)	(d)
S	0.300	0.300	0.300	0.300	0.300
C	0.400				
KCl	0.200	0.200	0.200	0.200	0.200
Ti	0.300				
HP	2.50	0.700	1.40	1.05	
$\text{KNO}_3$			1.00	1.00	1.00
$\text{KClO}_4$		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/](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.