

HOT GAS OR COLD GAS LAB

Using FERA inquiry method, Focus, Explore, Reflect, and Apply; by Robert L. Carr

Prelab, Focus

Three chemical reactions with these reactants;
(liquids) Hydrochloric acid 3M and Hydrogen peroxide 3%,
(solids) Zinc and Baking soda,
and with the catalyst Manganese dioxide (maybe Yeast)
Produces these products;
(gases) Oxygen, Carbon dioxide and Hydrogen.

Questions about these chemical reactions;

1. Reactions exothermic or endothermic?
2. Which is the fastest and slowest reactions?
3. What are types of chemical reactions?
4. Which gas is the most dense and the least dense?

Lab, Explore

Labware; three 250ml flasks, three balloons 10" (different colors), powder funnel, 50ml graduated cylinder and gram scale.

Mix 7 grams of solid in 100 mls of liquid to produce gas in balloon.
[10 points for each gas]

Put out flame with one balloon of gas.
[5 points]

Other two balloons tie together, Instructor will do flame test. Explosion!
[10 points]

Liquid condenses on blackboard.
[5 points]

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Activity, Reflect

(Could be a Labsheet)

Student name

[+5 points]

Which balloon (color) contains each product?

Product	Color
1.	;
2.	;
3.	;

[5points per product]

Show chemical reaction with a balanced chemical equation.

1. (A)

2. (B)

3. (C)

[5 points per equation]

Answer four questions from prelab.

1. (A) (B) (C)

2. (fastest) (slowest)

3. (A) (B) (C)

4. (most) (least)

[10 points]

Chemical equation for explosion.

[+5 points]

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Postlab, Apply

Collect labs.

Discussion

1. Choice of reactants
2. Gases produced, other products
3. Balanced chemical equations
4. Why? Hot or Cold?
5. Reaction speed? Why? Catalyst?
6. Reaction type?
7. Density and gases?
8. Uses; reactive?
 - A. Carbon dioxide
 - B. Hydrogen
 - C. Oxygen

Resources;

Modern Chemistry Text

CD Holt Chem File Interactive Tutor

www.hrw.com

Pennsylvania State Standards

3.4.12 A

Apply concepts about the structure and properties of matter.

3.4.10 B

Analyze energy sources and transfers of heat.

Other sources;

Hydrogen uses

www.ecoworld.com

www.eren.doe.gov

www.h2eco.org

www.hydrogenburner.com

Oxygen uses

www.sigmaxoxygen.com

www.rautaruukki.fi

www.singhaloxy.cjb.net

www.lungusa.org

Carbon dioxide uses

www.weldingsupply.com

www.cryoservice.co.uk

www.pp.okstate.edu