

«Битва титанов. Водород и кислород.»

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Цель урока:

1. Систематизировать знания о свойствах водорода и кислорода.
2. Вспомнить основные классы соединений веществ.
3. Закрепить умения составлять формулы солей и уравнения химических реакций, определять типы химических реакций.

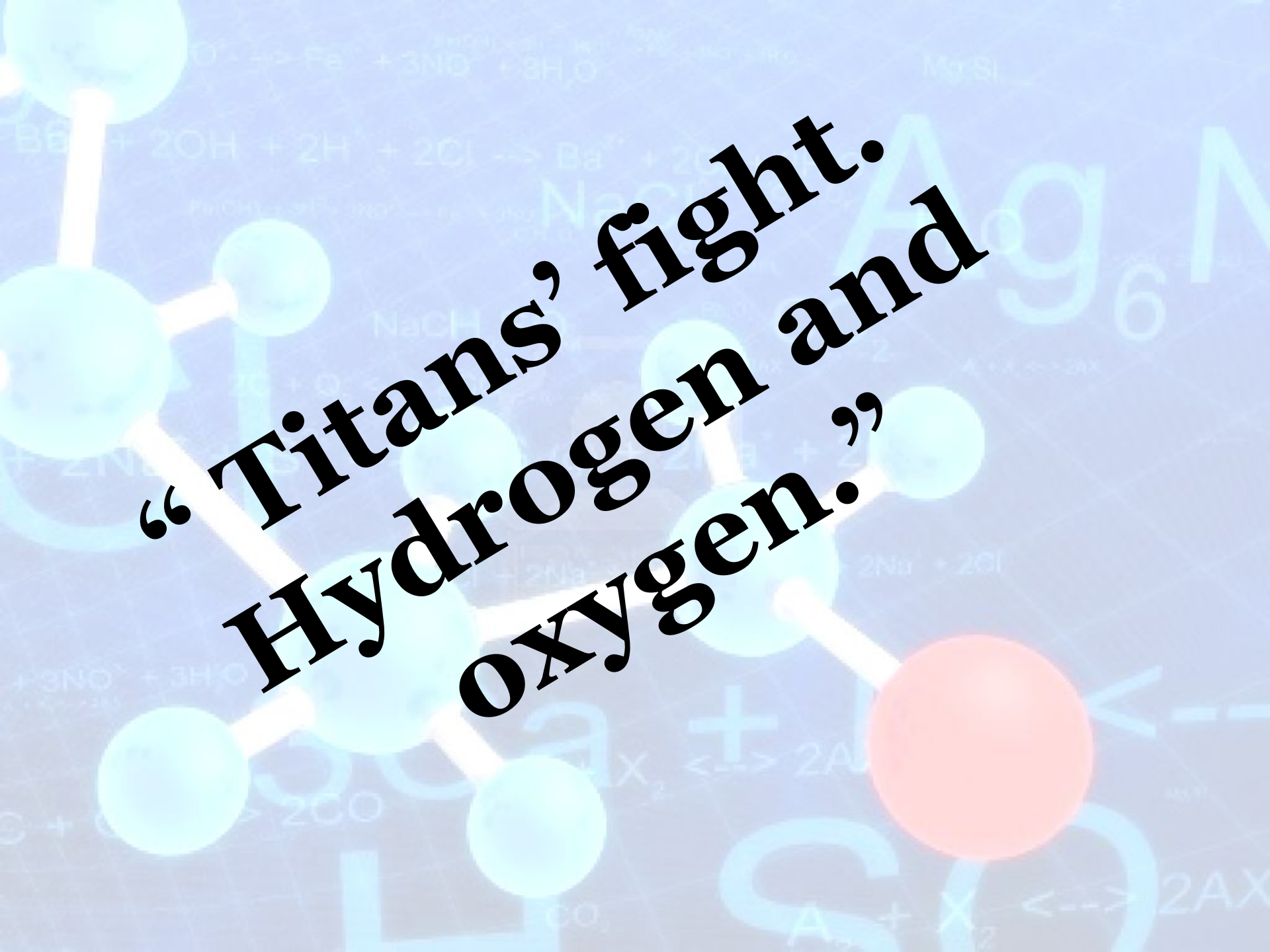


Lessons objectives

- Systematize knowledge about the properties of hydrogen and oxygen.
- Remember the main classes of compounds of substances.
- To fasten the ability to make up formulas of salts and chemical reaction equations, to determine the types of chemical reactions.



**Битва титанов.
Водород.
Кислород.**

The background features a light blue grid with various chemical formulas and symbols in a lighter blue font, including $\text{Fe}^{2+} + 3\text{NO} + 8\text{H}_2\text{O}$, MgSi , $\text{Ba}^{2+} + 2\text{Cl}^-$, NaCH_3 , $\text{Fe} + \text{O}_2$, $\text{Zn} + 2\text{Na}^+ + 2\text{Cl}^-$, $\text{Pb} + \text{O}_2$, $\text{C} + \text{O}_2 \rightarrow 2\text{CO}$, $\text{X}_2 \leftrightarrow 2\text{AX}$, CO_2 , $\text{A}_2 + \text{X}_2 \leftrightarrow 2\text{AX}$, and $\text{C} + \text{O}_2 \rightarrow 2\text{CO}$. A molecular model is overlaid on the grid, consisting of several light blue spheres connected by thin lines, and one prominent red sphere in the lower right quadrant.

**“Titans’ fight.
Hydrogen and
oxygen.”**



Hydrogen



Oxygen

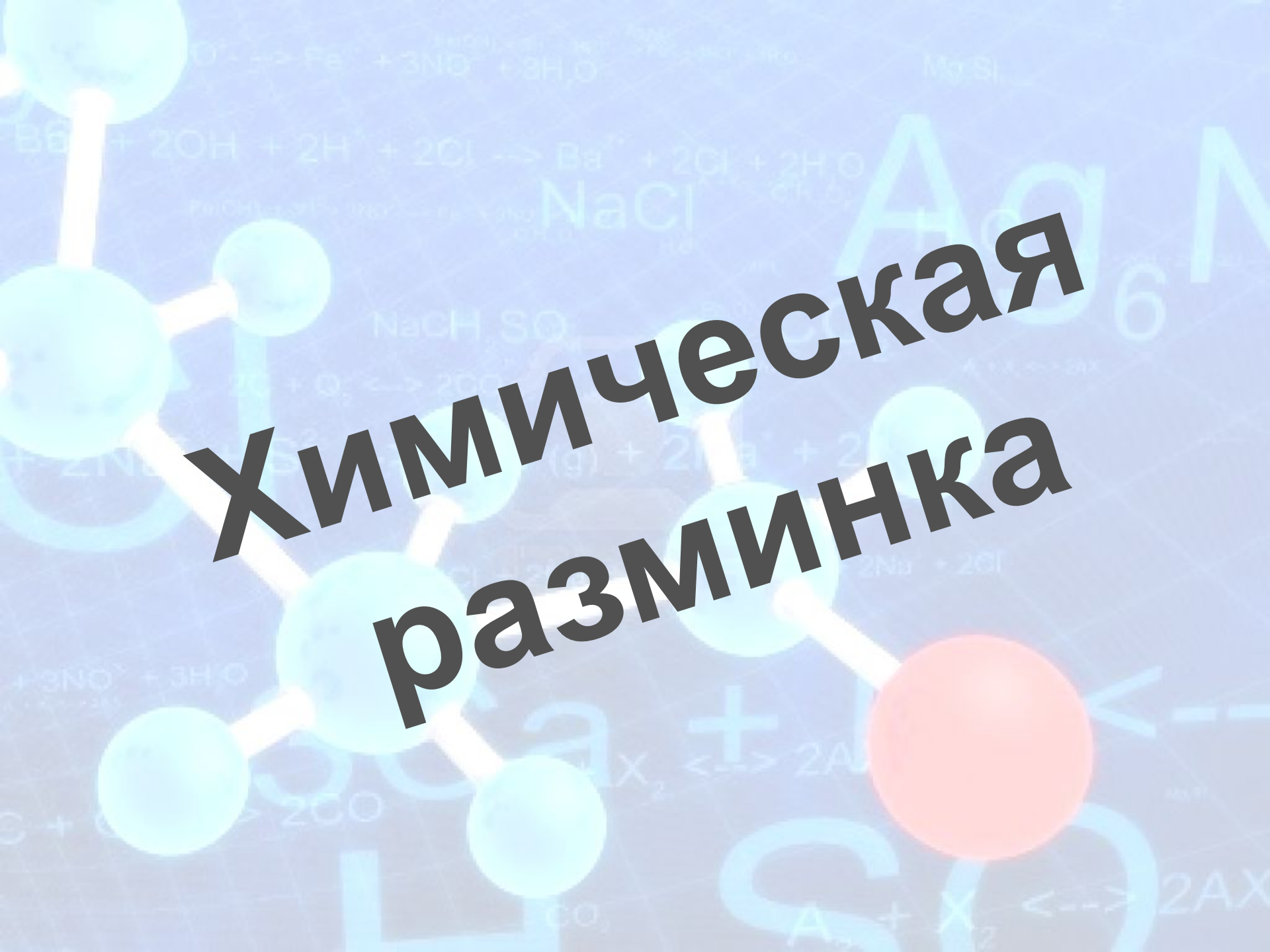
Lesson plan:

- 1. Let's start
- 2. Presentations
- 3. Properties.
- 4. Who is who?
- 5. Problem solving
- 6 True/False Questions.
- 7. «Film»
- 8. Test
- 9. Fantastic experiments

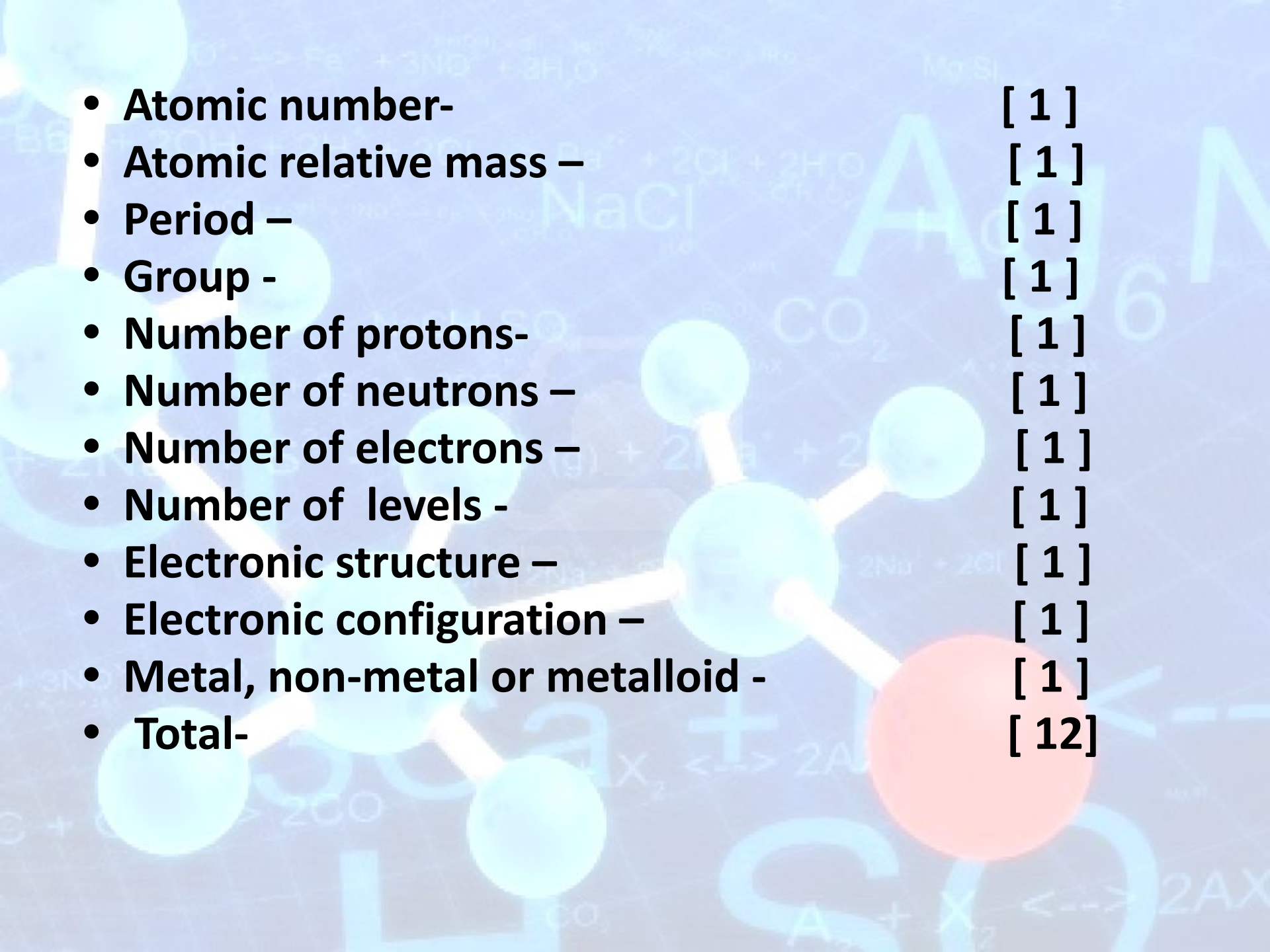
Действие № 1

Водород
и
кислород

A ball-and-stick model of a water molecule (H₂O) is centered in the image. The oxygen atom is represented by a large blue sphere, and the two hydrogen atoms are represented by smaller white spheres. The background is a light blue grid with faint chemical formulas and symbols, including NaCl , Ag , CO_2 , Ba^{2+} , Cl^- , H^+ , OH^- , Zn^{2+} , S^{2-} , NO_3^- , H_2O , X_2 , AX , CO , Na^+ , Cl^- , C , C , CO , CO_2 , A_2 , X_2 , AX , Ba^{2+} , Cl^- , H^+ , OH^- , Zn^{2+} , S^{2-} , NO_3^- , H_2O , X_2 , AX , CO , Na^+ , Cl^- , C , C , CO , CO_2 , A_2 , X_2 , AX .



**Химическая
разминка**

- 
- **Atomic number-** [1]
 - **Atomic relative mass –** [1]
 - **Period –** [1]
 - **Group -** [1]
 - **Number of protons-** [1]
 - **Number of neutrons –** [1]
 - **Number of electrons –** [1]
 - **Number of levels -** [1]
 - **Electronic structure –** [1]
 - **Electronic configuration –** [1]
 - **Metal, non-metal or metalloid -** [1]
 - **Total-** [12]



ХИМИЧЕСКИЙ РИНГ

Действие № 2

Презентации



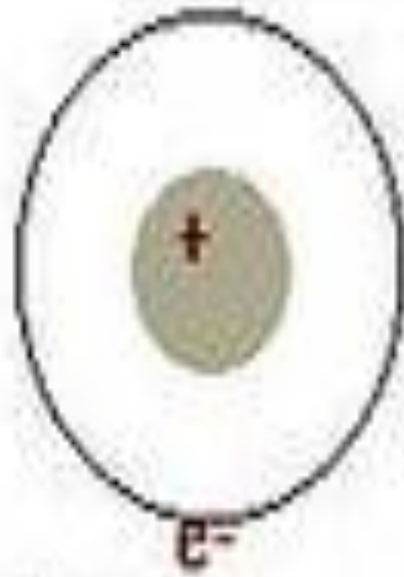
2 stage

Presentations

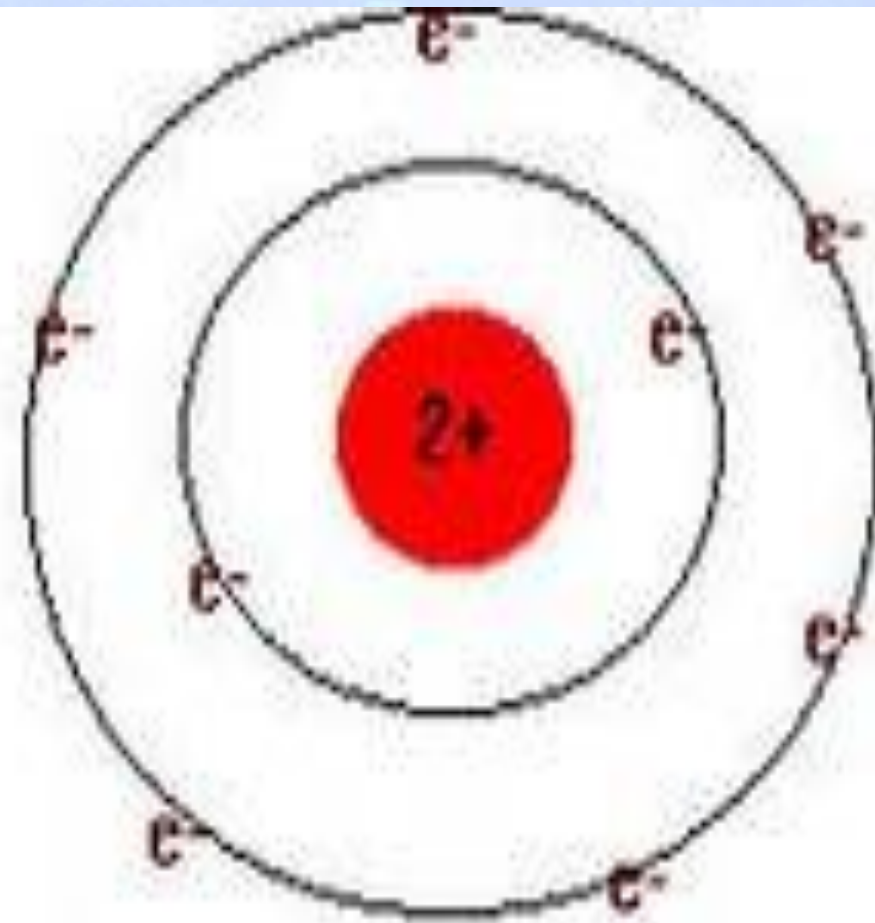
Hydrogen and oxygen



MgSi



**Hydrogen
Valency = 1**



**Oxygen
Valency = 2**

CO

$\text{A}_2 + \text{X}_2$

2X_2

H

Hydrogen Princess



#1

Non-metal

1.01
AMU

Hydrogen may be the lightest element, but her fiery kingdom holds three fourths of the universe by weight. Who would have thought that just one proton and electron could take over the world?

In stars, H atoms fuse to form Helium and release energy. Bring Helium from your deck to your hand.



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Element



ВОДОРОД

1.

H_2SO_4
 KOH
 CH_4
 H_2O

Ч Е С
 И М И Х
 Э Л
 Е М Е

К И Й
 Т Н

1

3.

Г А З

~~Д~~
~~В~~
~~З~~

H_2 t°

$t_{кип} - 253^\circ$

2.

В ЛАБОРАТОРИИ

$Me + \text{кислота}$

H_2O

ОРГАНИЧЕСКИЕ
ВЕЩЕСТВА

В ПРОМЫШЛЕННОСТИ

ВОДОРОД

4.

$2 + O_2 \xrightarrow{t^\circ} H_2O$
 РОЖДАЮЩИЙ ВОДУ

$2 + MeO \xrightarrow{t^\circ} Me^+ H_2O$
 ВОССТАНОВИТЕЛЬ



Oxygen Life-Giver



#8

Non-metal

16.00
AMU

With his staff of energy, Oxygen breathes life into plants and animals. He may look peaceful, but his fiery powers of combustion are legendary!

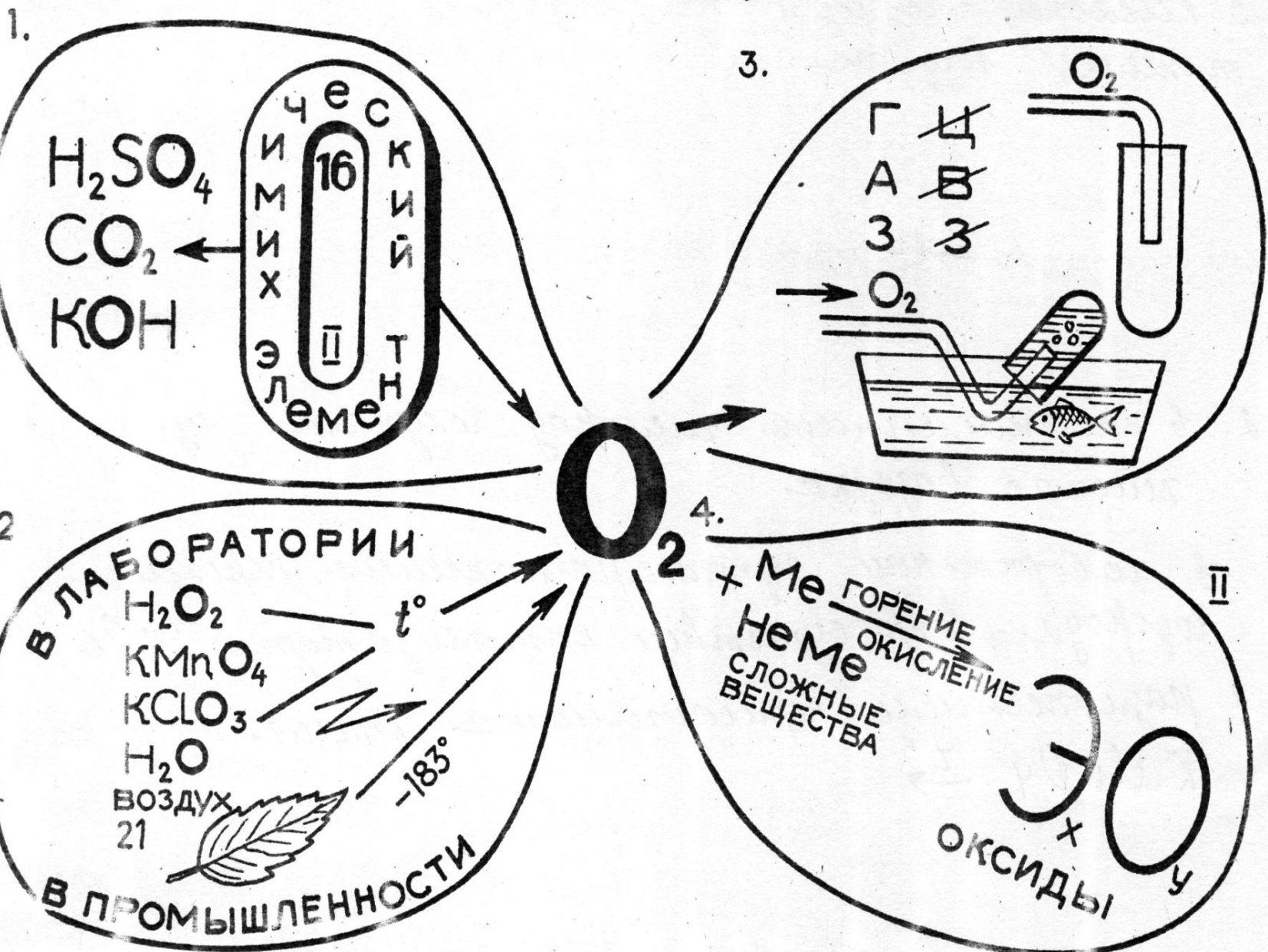
If angered, Oxygen rusts a metal element on the field and sends it to the toxic waste pile.



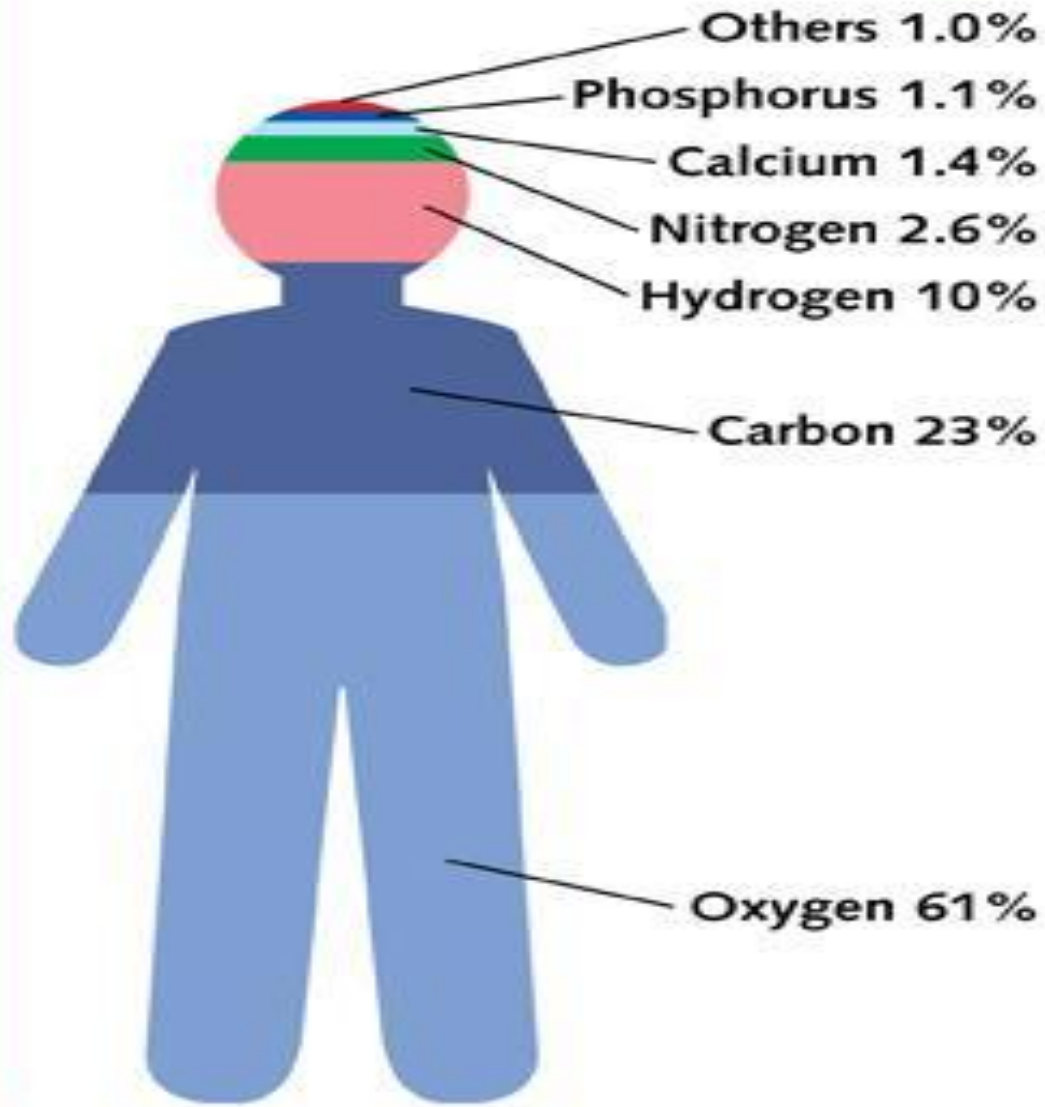
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Element

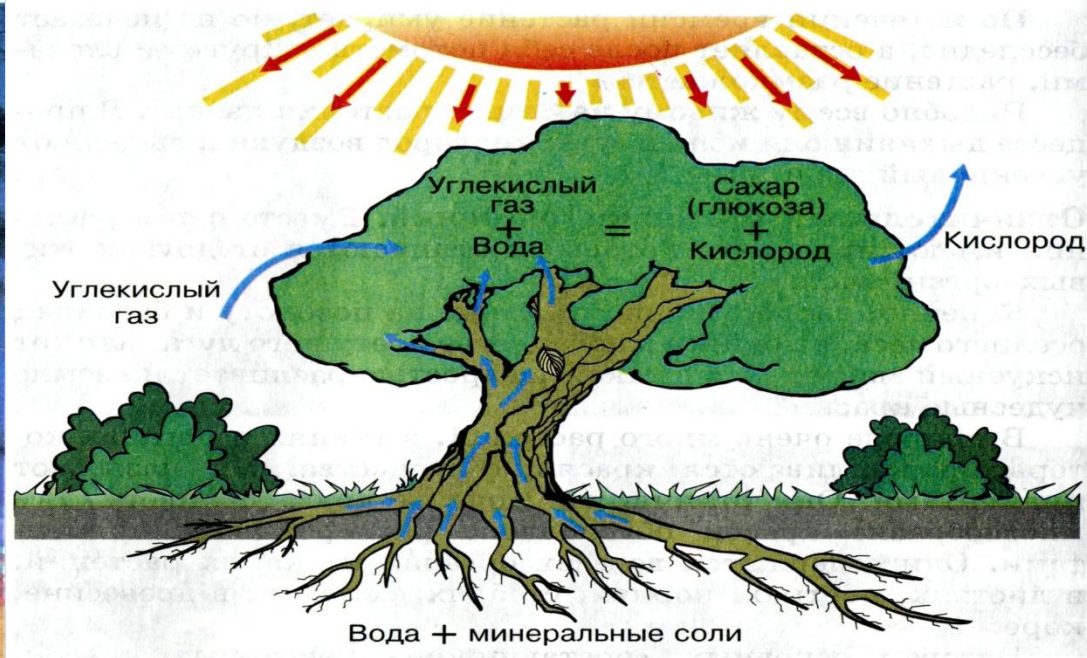


КИСЛОРОД. ОКСИДЫ.



Percentages of Various Elements in a Human Body



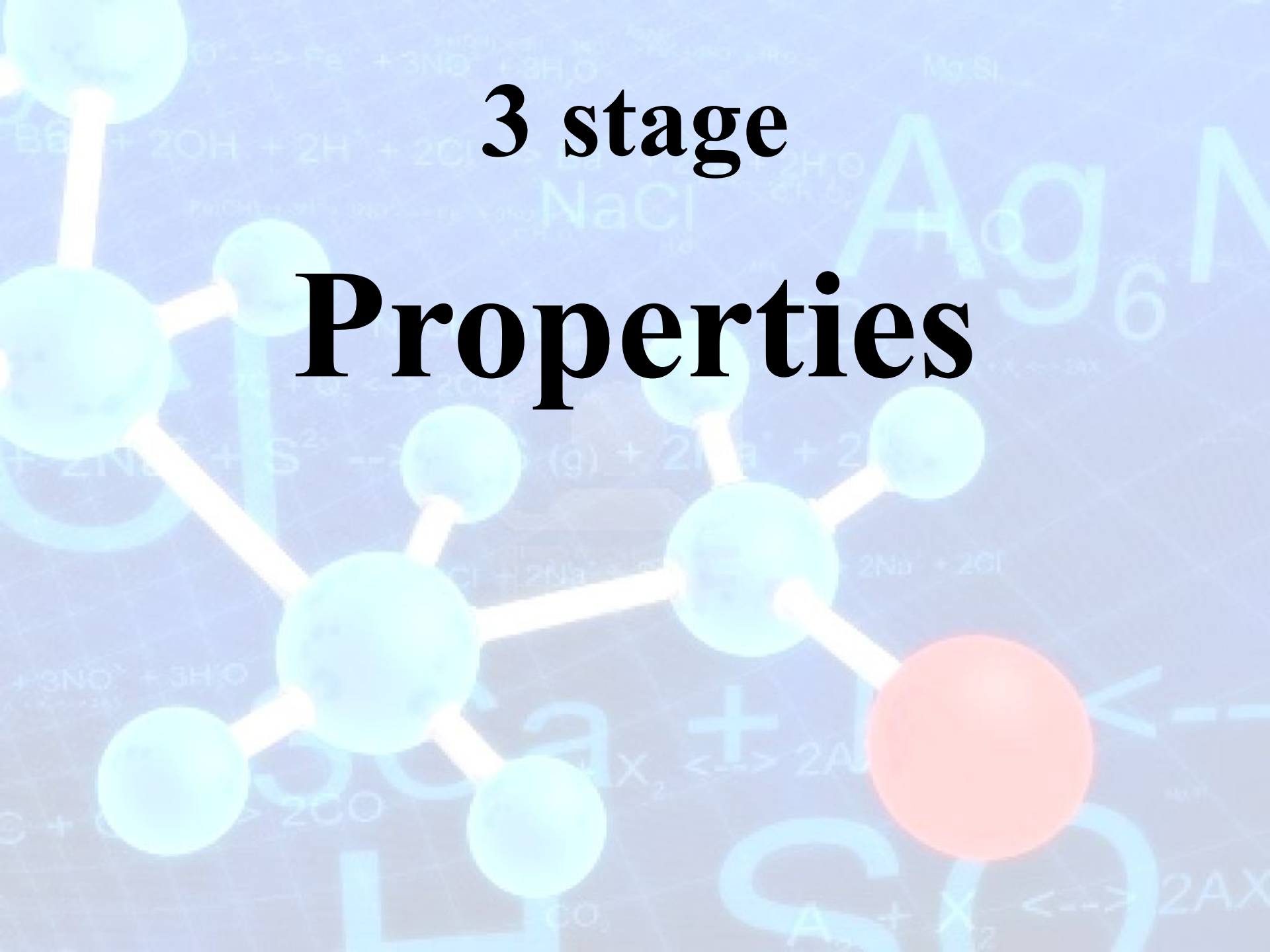


Действие № 3

Свойства

3 stage

Properties



Property

Valency

Formula

Colorless

Odorless

Tasteless

Diatomic gas

Heavier than air

Slightly soluble in water

Hydrogen

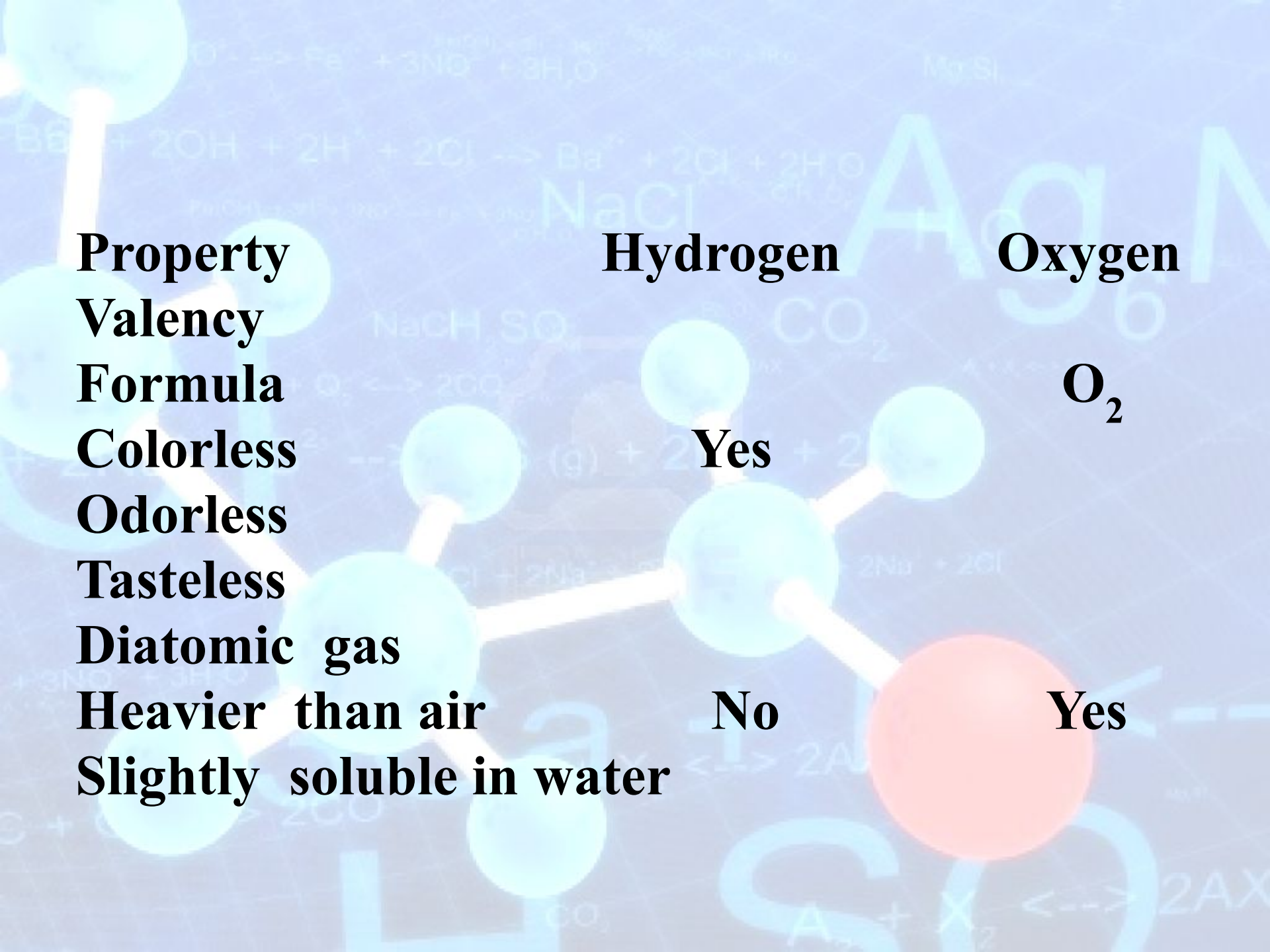
Oxygen

O₂

Yes

No

Yes



4 stage

Who is who?

What is the name of famous scientist, who opened the element?



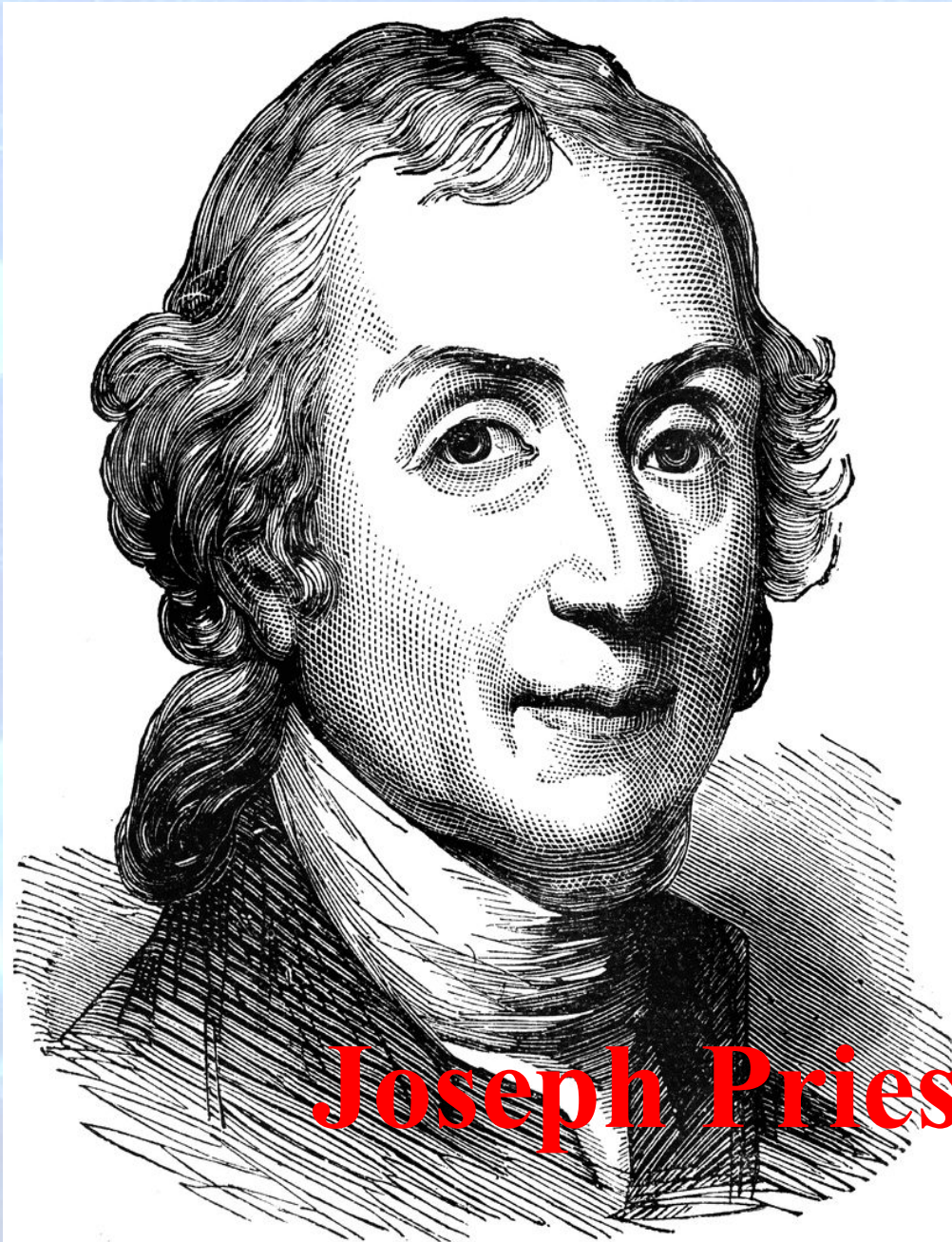
**Who opened
hydrogen?**



**Henry
Cavendish**

The image features a molecular model of a complex organic molecule, possibly a protein or a large organic compound, rendered in a semi-transparent, light blue color. The model consists of numerous spheres connected by rods, representing atoms and bonds. A prominent feature is a large, solid red sphere, likely representing an oxygen atom, positioned in the lower right quadrant. The background is a light blue gradient with faint, semi-transparent chemical formulas and symbols scattered throughout, including $\text{Fe}^{3+} + 3\text{NO}_3^- + 8\text{H}_2\text{O}$, MgSi , $\text{Ba}^{2+} + 2\text{Cl}^- + 2\text{H}_2\text{O}$, NaCl , Ag , S^{2-} , $\text{Ni}^{2+} + 2\text{Cl}^-$, $\text{Pb}^{2+} + 3\text{H}_2\text{O}$, $\text{X}_2 \leftrightarrow 2\text{AX}$, $\text{C} + \text{O}_2 \rightarrow 2\text{CO}$, and $\text{A}_2 + \text{X}_2 \leftrightarrow 2\text{AX}$. The overall aesthetic is scientific and educational.

**Who opened
oxygen?**



Joseph Priestley

5 stage

Problem solving

Find a mass fraction of oxygen in carbonic acid

Find a mass fraction of hydrogen in sulfuric acid

6 stage

1. Water is known by two names

A) dihydrogen oxide

B) hydrogen hydroxide

True

False

2. Hydrogen \rightarrow atoms contain

1 proton and 1 electron

True

False

3. Oxygen \rightarrow atoms contain 8 protons and 16 electrons

True

False

7 stage

•Фильм!

•Film!

The background features a molecular model on the left with blue and red spheres connected by yellow rods. The rest of the background is a light blue grid with various chemical formulas and symbols in a lighter blue color, including $\text{Fe} + 3\text{NO} + 8\text{H}_2\text{O}$, NaCl , Ag , NaCH_3SO , CO_2 , $\text{Fe} + 2\text{Na} + 2\text{Cl}$, $\text{Fe} + 3\text{NO} + 3\text{H}_2\text{O}$, $\text{X}_2 \leftrightarrow 2\text{AX}$, CO_2 , $\text{A} + \text{X}_2 \leftrightarrow 2\text{AX}$, and $\text{Ca} + \text{X}_2 \leftrightarrow 2\text{AX}$.

Действие № 8

Stage № 8

TEST!

Test

1. Choose the formula of an mercury(II) oxide :



Test

2. Choose the formula of an hydrochloric acid:



Test

3. Choose the formula of a phosphoric acid:

A) HCl

B) HNO₃

C) H₂CO₃

D) HF

E) H₃PO₄

Test

4. Choose the formula of a magnesium permanganate:

- A) MgCl_2
- B) KMnO_4
- C) MnCO_3
- D) MnF_2
- E) $\text{Mn}(\text{NO}_3)_2$

Test

5. Choose the formula of the substance which doesn't belong to the logical group:

- A) H_2
- B) N_2
- C) Cl_2
- D) O_3
- E) Br_2

True results

•1.B

•2. B

•3.E

•4 B.

•5.D

Действие № 9

Итоги урока

РЕФЛЕКСИЯ.

1. Я узнал много нового и интересного.
2. На уроке мне постоянно приходилось работать.
3. На все возникшие в ходе урока вопросы я получил ответы.
4. Мне это пригодится в повседневной жизни.
5. Считаю, что работал добросовестно и достиг цели урока.

REFLECTION

Write your opinion about the lesson:

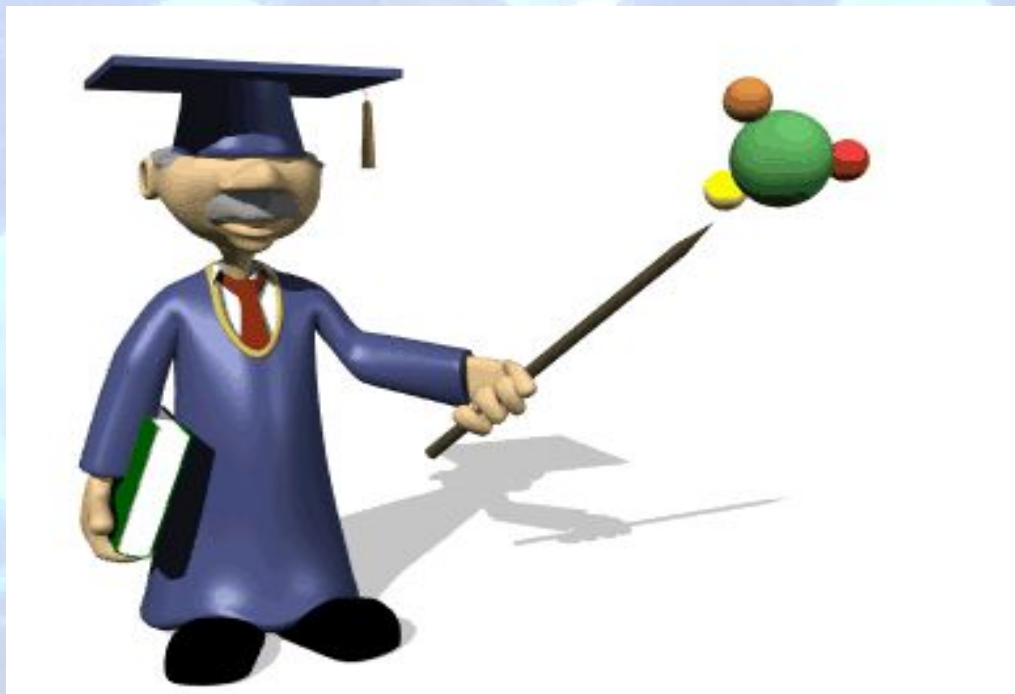
It was interesting _____

It was important _____

It was needs _____

Homework

- Read book.
- § 14. ex.6,7



*СПАСИБО ЗА
ВАШ УРОК!*

**Thanks for your
lesson!**

