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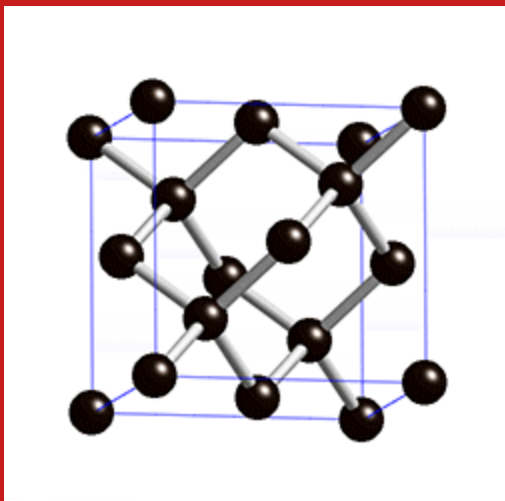
Carmen Diez Calzada



Cristina Nicolaita



Panagyota Argyri



LICEUL NATANAEL SUCEAVA

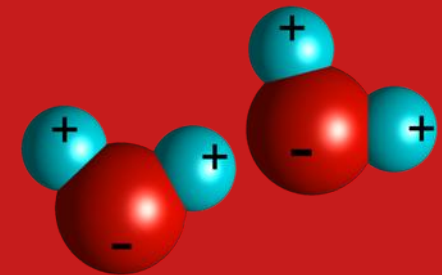
Inspiring Science Education



Metode de predare prin investigare științifică

Prof. Valerica Ignătescu

- **LESSON PROJECT**
- **Teacher:** Valerica Ignătescu
- **School:** Natanael High School Suceava
- **Class:** 9th (science profile, 2 chemistry classes a week)
- **Date:** February 26th, 2016
- **Curricular area:** Mathematics and science
- **Subject:** chemistry
- **Unit:** Solutions
- **Lesson title:** Molar concentration
- **Lesson type:** Laboratory lesson **Time:** 50 minutes
- **Aim:** developing general skills by acquiring and reinforcing knowledge, developing practical skills and intellectual abilities
- **Specific skills aimed at: (according to current the school curriculum):**
- 2.1 Carrying out investigations in order to observe some characteristics, properties, relations
- 2.3 Drawing conclusions based on the information from the research sources, experimental data which respond to the initial hypothesis
- 3.1. Analyzing the problems in order to establish the context, the relevant relations, the stages of solving them
- 3.2. Integrating mathematical relations in problem solving
- 4.2. Using correctly the terminology specific to chemistry





Solute Amount
(moles)

1.0



0.51 mol

0

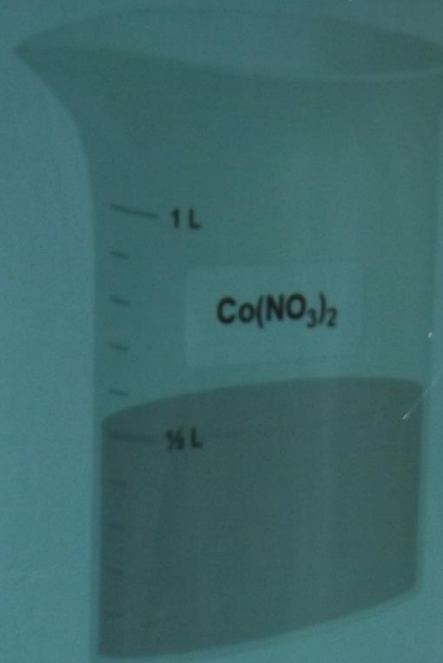
Solution Volume
(Liters)

1.0



0.51 L

0.2



$\text{Co}(\text{NO}_3)_2$

1/2 L

Solution Concentration
(Molarity)

5.0



1.00 M



Solute:

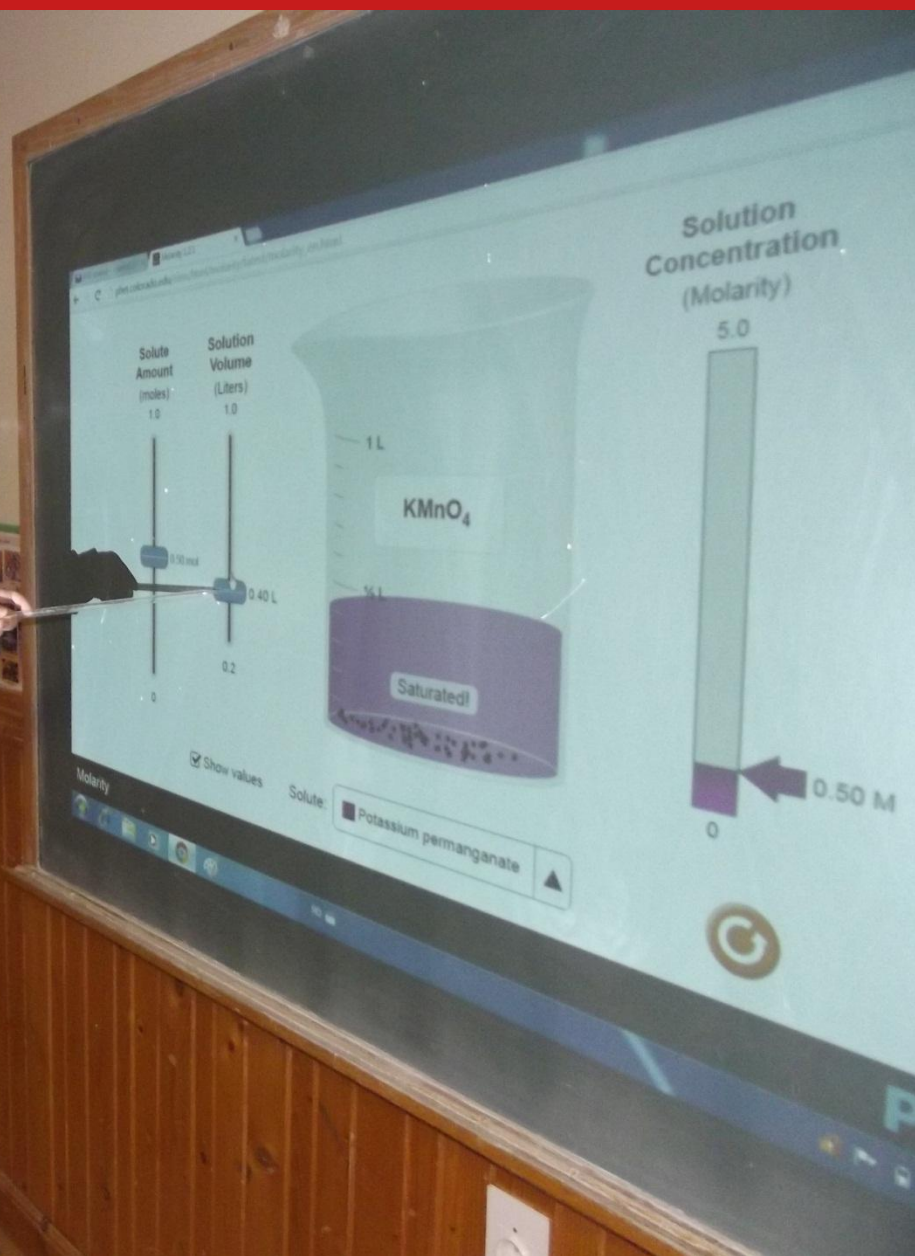
Cobalt (II) nitrate

☒ Show values

PHET

...la Dumnezeu
lor vestește lucrarea
r Lui..."

Ps.19.1

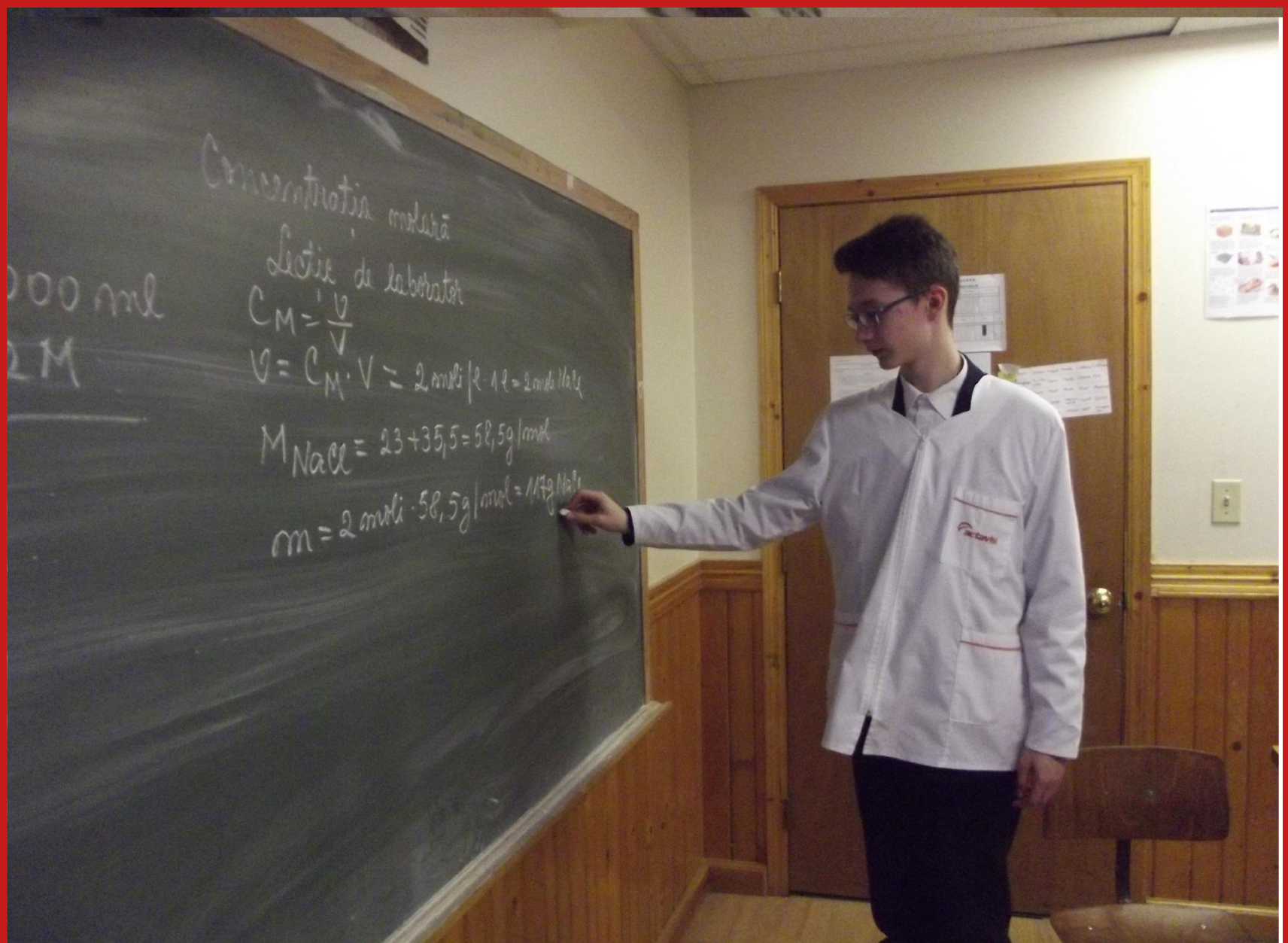












Concentrația molară

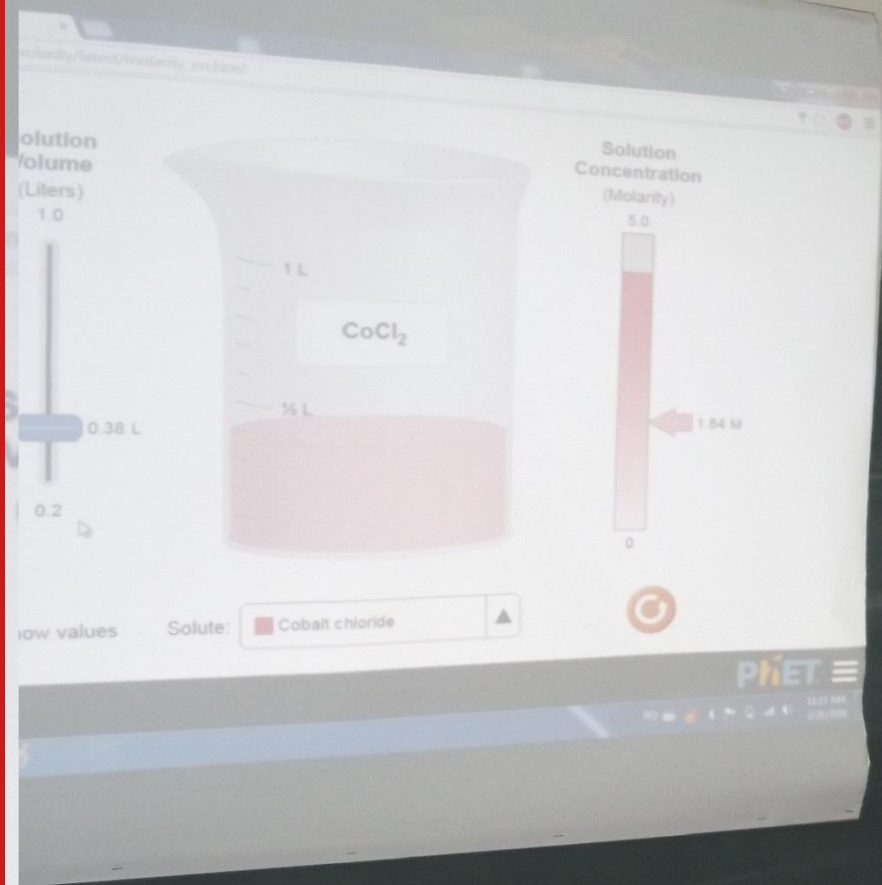
Lecție de laborator

$$C_M = \frac{n}{V}$$

$$V = C_M \cdot V = 2 \text{ moli/l} \cdot 1 \text{ l} = 2 \text{ moli NaCl}$$

$$M_{\text{NaCl}} = 23 + 35,5 = 58,5 \text{ g/mol}$$

$$m = 2 \text{ moli} \cdot 58,5 \text{ g/mol} = 117 \text{ g NaCl}$$

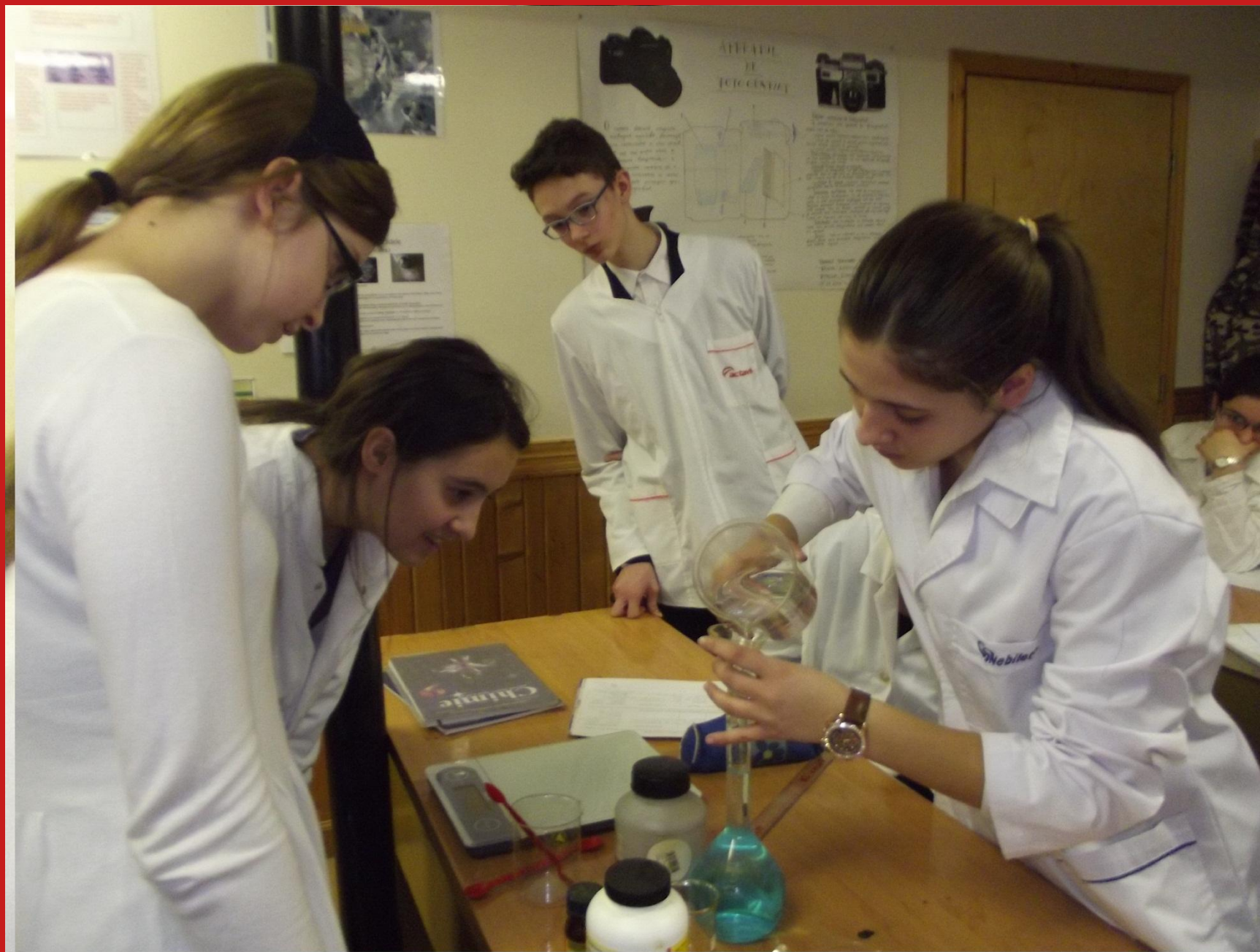


Concentratia molară
 Notie de laborator

1) $V = 1000 \text{ ml}$
 $C_M = 2 \text{ M}$
 $V = ?$

$M \cdot V = 2 \text{ mol/l} \cdot 1 \text{ l} = 2 \text{ mol}$
 $M = 23 + 35,5 = 58,5 \text{ g/mol}$
 $2 \text{ mol} \cdot 58,5 \text{ g/mol} = 117 \text{ g}$







Concentratia molară
datorită la substanță

$V = 250 \text{ ml CuSO}_4$
 $C_M = 0,1 \text{ M}$
 $n = 0,25 \text{ l} \cdot 0,1 = 0,025 \text{ mol}$

$M_{\text{CuSO}_4 \cdot 5\text{H}_2\text{O}} = 160 + 5 \cdot 18 = 250 \text{ g/mol}$
 $12 \dots 0,1 \text{ mol}$
 $0,25 \dots 0,025 \text{ mol CuSO}_4 \Rightarrow m = 0,025 \cdot 250 = 6,25 \text{ g}$

Cu^{2+}
 SO_4^{2-}
 $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$
 $n = \frac{250 \text{ g}}{250 \text{ g/mol}}$



- Prin aceste activități urmăresc:
- Stimularea interesului elevilor pentru implementarea de proiecte educaționale științifice;
- Implicarea elevilor în activități non-formale;
- Promovarea școlii pe plan internațional prin intermediul proiectelor eTwinning;
- Realizarea de schimburi științifice de experiență și de utilizare TIC între elevi din școli de pe toate continentele ;
- Integrarea cunoștințelor în curriculum, ca aplicații ale matematicii, fizicii, geografiei, informaticii, istoriei științelor, limbilor străine, etc.



Vă mulțumesc!