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**PHYSICS**

**Task 3: Measuring Density Of Humid Wood**

Aim: Define the density of various species of wood (pine tree, birch tree, fir tree) in this area.

Integrated subjects: Biology, Chemistry, Geography, Physics.

Equipment: weight scale, knife or wood saw, measuring glass

**I Measuring the samples of different tree species**

Equipment: weight scale, 

 Instructions:

1. Take the samples (a branch of cylindrical form, length up to 10 cm) of different wood samples (3 samples of each species)
2. Clean the bark
3. Measure the weight of each sample (without bark): m1, m2, m3

Table 1 Weight of samples

|  |  |  |  |
| --- | --- | --- | --- |
| Wood species | Weight of sample 1, m1(g-gramme) | Weight of sample 2, m2(g-gramme) | Weight of sample 3, m3(g-gramme) |
| Fir tree |  |  |  |
| Pine tree |  |  |  |
| Birch tree |  |  |  |
| Student’s option |  |  |  |
| Student’s option |  |  |  |
|  |  |  |  |

**II Measure the body volume by method of dipping**

**Equipment:** measuring glass, needle or pin, clamp or peg

|  |  |  |
| --- | --- | --- |
| http://analytic-lab.ru/storage/gi/02e21ce57b234bd8b020e3166d85e257.jpg | Деревянный-пробирку-зажим-зажим-трубки-трубка-зажим-зажим-трубки-дерево-химия-лабораторное-оборудование-химический-эксперимент-коробка.jpg_350x350.jpghttp://vmede.org/sait/content/Stomatologiya_atlas_basikan_2007/6_files/mb4_095.jpeg | Картинки по запросу булавка Картинки по запросу игла |
| measuring glass | clamp or peg | needle or pin |

***Method of measuring the body volume by dipping (immersion):***

A) measure the initial volume of water in the measuring glass V0

Initial volume V0= ................ ml

B) Force a needle into the wood sample on the side of the cutting

C) Clamp the tail of the needle with a clamp or peg

D) Dip the sample into the measuring glass with water ( the sample is fully dipped into the water)

E) Measure the water volume in the measuring glass after the dipping of wood sample V1

Water volume V1=………………………………. ml

F) The sample volume is the difference of water volumes before and after the dipping Vsample=V1-V0

Sample volume Vsample= .................................... ml

G) Converse sample volume into cm3, knowing that 1 ml = 1 cm3

Sample volume Vsample= .................................... cm3

Instructions:

1. Measure the volume of samples by dipping and record the results into the table

Table 2 Volume of samples

|  |  |  |  |
| --- | --- | --- | --- |
| Wood species | Volume of sample 1, Vsample1 (cm3) | Volume of sample 2, Vsample2 (cm3) | Volume of sample 3, Vsample3 (cm3) |
| Fir tree | V0 | V1 | Vпр1 | V0 | V1 | Vпр2 | V0 | V1 | Vпр3 |
| Pine tree |  |  |  |  |  |  |  |  |  |
| Birch tree |  |  |  |  |  |  |  |  |  |
| Student’s option |  |  |  |  |  |  |  |  |  |
| Student’s option |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

**III Calculation of density of humid wood**

**Instructions:**

1. Using the data of table 1 and table 2 calculate the density of wood using the formula:

$ρ=\frac{m}{V}$ , where

m – weight of wood sample (g);

V – volume of wood sample (cm3);

*Ρ- density (*$\frac{g}{cm^{3}}$*)*

1. Record the results of calculation into table 3

Table 3 Density of wood species

|  |  |
| --- | --- |
| Wood species | *Density of wood species (*$\frac{g}{cm^{3}}$*)* |
| Fir tree |  |
| Pine tree |  |
| Birch tree |  |
| Student’s option |  |
| Student’s option |  |
|  |  |

**IV Compare the densities of various wood species and conclude**

Comparison:

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………..

Conclusion:

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