

Virtual labs Chemcollective
By M.E. Mohammed Mehdi Saleh

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة الانبار



شعبة ابن سينا للتعليم الالكتروني

تقدم

Virtual Labs

Chemcollective المختبرات الافتراضية

اعداد : م.م. محمد مهدي صالح

مختبر الكيمياء في جامعة بتسبيرج في الولايات المتحدة الأمريكية



Online Resources for Teaching and Learning Chemistry



Carnegie Mellon University



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• تم إنشاء معمل افتراضي لتعليم الكيمياء بواسطة أستاذ الكيمياء ديفيد يارون وآخرون.

• الغرض من هذا المشروع هو تحسين التعليم في الدورات التمهيدية للكيمياء من خلال إكمال التعليم التقليدي بمعالجات تسمح للطلاب بإجراء التجارب بشكل مماثل لما يحققه الطلاب الممارسون للتجارب العملية بشكل حقيقي.

• يستطيع الطلاب تصميم أو تنفيذ تجارب خاصة بهم بسرعة ويرون أمثلة لتجارب الكيمياء التي كانوا يرونها في معمل الحقيقي



الواجهة الرئيسية للموقع

ChemCollective

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Resources to Teach and Learn Chemistry

The ChemCollective is a collection of [virtual labs](#), [scenario-based learning activities](#), [tutorials](#), and [concept tests](#). Teachers can use our content for pre-labs, for alternatives to textbook homework, and for in-class activities for individuals or teams. Students can review and learn chemistry concepts using our virtual labs, simulations, and tutorials. The ChemCollective is organized by a group of faculty and staff at Carnegie Mellon who are interested in using, assessing, and creating engaging online activities for chemistry education.

Resources by Topic

- Stoichiometry
- Thermochemistry
- Kinetics
- Equilibrium
- Acid-Base Chemistry
- Solubility
- Oxidation/Reduction and Electrochemistry
- Analytical Chemistry/Lab Techniques
- Physical Chemistry
- Properties of Solutions

Resources by Type

- Virtual Labs
- Autograded Problems
- Tutorials

Featured Resource

Quantitative Analysis of Food Dyes

Dye Color	Concentration
Blue	0.55
Green	0.65
Yellow	0.55
Orange	0.65
Red	0.65

Quick Links

- Virtual Lab
- Mixed Reception Game
- Stoichiometry Tutorials

News

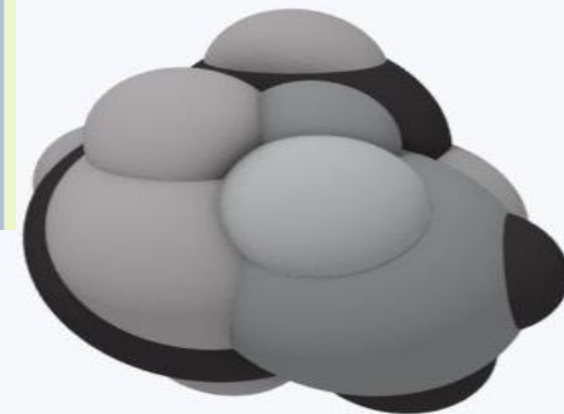
- Release of new HTML5 Virtual Lab.

What's New

- Kinetics of Bleaching of Food Dyes Activity

لغرض زيارة المختبر
من قائمة quick links
انقر على virtual labs

او من قائمة
Resources by Type
انقر على virtual labs



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RESOURCES BY TOPIC

[Stoichiometry](#)[Thermochemistry](#)[Kinetics](#)[Equilibrium](#)[Acid-Base Chemistry](#)[Solubility](#)[Oxidation/Reduction and Electrochemistry](#)[Analytical Chemistry/Lab Techniques](#)[Physical Chemistry](#)[Properties of Solutions](#)

RESOURCES BY TYPE

[Virtual Labs](#)[Autograded Problems](#)[Tutorials](#)[Scenario-Based Activities](#)

RESOURCE TYPE: Virtual Labs

The Virtual Lab is an online simulation of a chemistry lab. It is designed to help students link chemical computations with authentic laboratory chemistry. The lab allows students to select from hundreds of standard reagents (aqueous) and manipulate them in a manner resembling a real lab. [More information and offline downloads.](#)

Please scroll below to find our collection of pre-written problems, they have been organized by concept and ranked by difficulty.

- > Stoichiometry
- > Thermochemistry
- > Equilibrium
- > Acid-Base Chemistry
- > Solubility
- > Oxidation/Reduction and Electrochemistry
- > Analytical Chemistry/Lab Techniques

قائمة منسدلة للمختبرات المتاحة لتجارب الكيمياء

بعد النقر على القائمة
تظهر التجارب المتاحة

Stoichiometry

The Mole, Molarity, and Density

Glucose Dilution Problem

In this activity, students use the virtual lab to create a 0.025M glucose solution from a standard 1M glucose solution. First, they calculate the correct volumes of 1M glucose solution and water to mix together...

Get Info

Go

Acid Dilution Problem

In this activity, students use the virtual lab to create 500mL of 3M HCl solution from a concentrated stock solution of 11.6M HCl. They must first calculate the correct volumes of 11.6M HCl solution and water to...

Get Info

Go

Cola and Sucrose Concentration Problem

In this activity, students use the virtual lab to prepare a sucrose solution for a soda recipe. They next calculate the concentration of their solution in terms of molarity, percent mass and density. Finally, they...

Get Info

Go

Making Stock Solutions from Solids

In this activity, students use the virtual lab to create stock solutions starting from solid salts. Students must first calculate the correct amount of solid to make the solution. Next, they prepare the solution...

Get Info

Go

Identifying the Unknown Metal (Metals Density Problem)

In this activity, students use the virtual lab to identify an unknown metal by measuring its density and comparing their measurements to the densities of known metals.

Get Info

Go

Identifying an Unknown Liquid from its Density

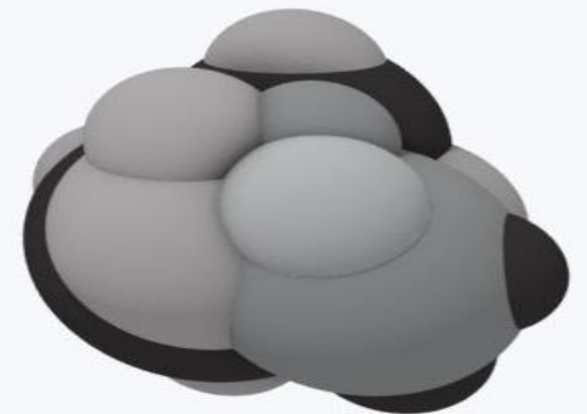
In this activity students use the virtual lab to design an experiment to determine the identity of mislabeled bottles using the densities of the solutions inside.

Get Info

Go

١- لأجل الذهاب الى صفحة
التجربة انقر على Go

٢- لأجل معرفة تفاصيل
التجربة انقر على Get info



Glucose Dilution Problem Info

١

Download Assignment



Download Offline Version

٢

Go to Activity



٣

٤

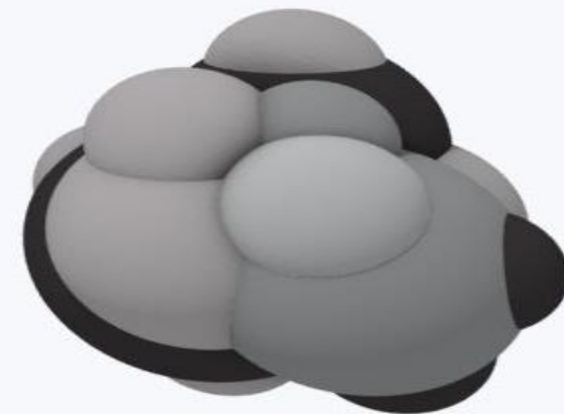
Description

In this activity, students use the virtual lab to create a 0.025M glucose solution from a standard 1M glucose solution. First, they calculate the correct volumes of 1M glucose solution and water to mix together to create the final 0.025M solution. Next, they prepare the solution using the appropriate glassware. Students can check to see if their procedure was correct using the concentration viewer in the solution info panel.

RESOURCE TYPE	Virtual Lab More information and offline downloads. <i>Please scroll below to find our collection of pre-written problems, they have been organized by concept and ranked by difficulty.</i>
TOPIC(S)	Stoichiometry
SUBTOPIC(S)	The Mole, Molarity, and Density High School / Introductory Chemistry First-Year Undergraduate / General
DIFFICULTY	Introductory
PUBLICATION DATE	2003-10-01
CONTRIBUTOR(S)	Mr. Michael Karabinos, Carnegie Mellon University Mr. Donovan Lange, Dr. Dave Yaron, Carnegie Mellon University

بعد النقر على **get info** تظهر هذه الشاشة وتحتوي على :

- ١- تحميل نسخة theory PDF النظرية.
- ٢- تحميل المختبر Offline.
- ٣- للذهاب الى التجربة.
- ٤- توضيح .



VIRTUAL LAB: Glucose Dilution Problem

We are pleased to announce a new HTML5 based version of the virtual lab. Please use FireFox or Chrome web browser to access this page, errors have been reported when using Internet Explorer.

[Introductory Video and Support Information](#)

Virtual Lab File Edit View Help EN Dilution Problem 1

Stockroom

Solutions Glassware Tools

Distilled H₂O
Distilled Water
3.0L

1M C₆H₁₂O₆
1M Glucose Solution
0.1L

Workbench 1

YouTube

١- اسم التجربة .

٢- فيديو تمهيدي ومعلومات الدعم على YouTube

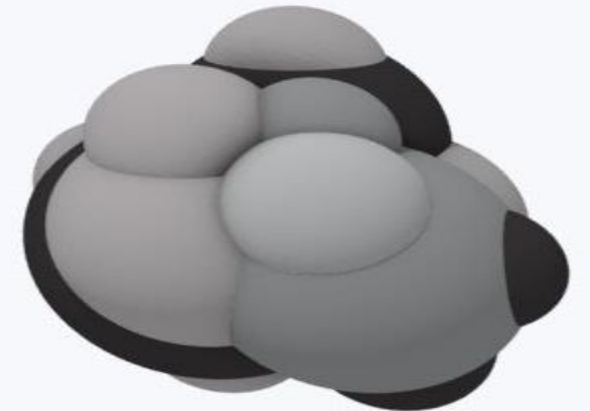
٣- معلومات عن التجربة.

٤- في stockroom سوف نجد الأدوات والمحاليل

لأجل الاستخدام يرجى النقر على الجزء المطلوب

ووضعه في workbench .

٥- منصة العمل workbench



١ اختر أدوات التجربة المطلوبة لتظهر في workbench كما موضح

Virtual Lab File Edit View Help EN Dilution Problem 1

Stockroom +

Information ≡

Name: 5 mL Pipette
Volume: 0.0000 mL

Species (aq) Molarity

Temperature: 25.00°C
25.0 deg

pH: 7.00

Workbench 1

1M $C_6H_{12}O_6$
100.00 mL @ 100°C

5 mL Pipette
0.0000 mL @ 25.0°C

250 mL Beaker
50.000 mL @ 25.0°C

151.4772 g TARE

1.0 kJ/s

- Remove Solid
- Remove Liquid
- Duplicate
- Thermal properties...
- Rename
- Remove

٢ لتحكم في اعدادات الأدوات المستخدمة right click على الأداة المطلوبة لتظهر قائمة التحكم

