

m.socrative.com
room “acds2016”

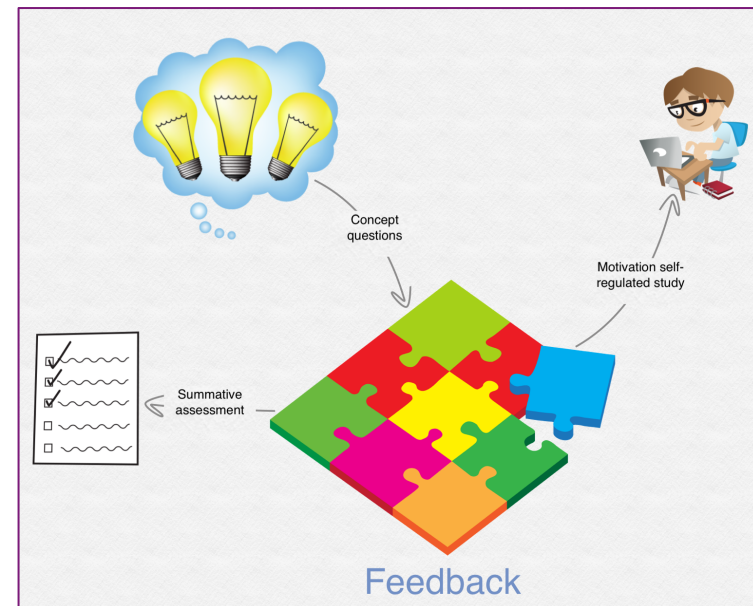


Knowing your FY students:



..... Diverse prior learning
..... Diverse interests
..... Diverse abilities

- Provision of feedback to students as a catalyst for self-regulated learning towards goals (**where am I going?**)
- Supporting iterative encounters with networked conceptions *plus additional feedback* (**how am I going?**)
- Enabling students to identify the relevance of their learning (**where to next?**)



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Create change

Engaged learning in lectures



Osmosis in the kitchen



Sod Acatalk_music.wmv

Engagement Connecting to Chemistry

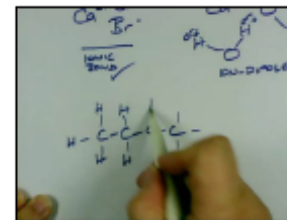
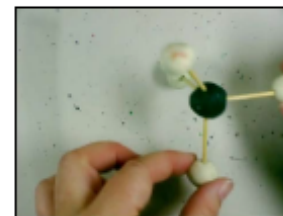
Aim:
Providing links to students lives and real world contexts.
Concrete examples which are memorable.

Activity:
Visualiser - demonstration
Youtube videos (context/experiment)
Explanations

Core Concepts Foundations

Aim:
Link back to prior knowledge
Introduce 2 new concepts
maximum

Activity:
Traditional information delivery
Visualiser explanation



Multimodal Translating Representations

Aims:
Drawing chemical structures
Interpreting representations
Acquire literacy

Activity:
Apply the chemistry learning triangle
Videos/demonstration of macroscopic phenomena

Feedback In-class application/explanation

Aims:
Students test their understanding immediately
Provide formative feedback

Activity:
Observe/explain (video)
Problem-solving (clicker questions)
Visualiser - modelling
Explanations



Thermite reaction

<http://www.youtube.com/watch?v=201g6f0n000&list=UL&index=1&v=201g6f0n000>

Did you spot the issue with the reaction equation in this video?



This reaction is still used to weld railway tracks together!

Homework:

Write the half-reactions for this redox reaction

© 2011 CHEM100: Foundations & Reactivity

Transitions in lectures:

- Review & engage
- New concepts
- Apply (student centred)
- Elaborate & extend

Colligative properties are useful in the determination of molar masses of macromolecules such as polymers and proteins.

Question

The osmotic pressure of a protein solution containing 10 mg mL⁻¹ is 2.44 kPa at 25 °C. What is the molar mass of the protein?



Which of the following is closest to your answer?



- A. $1.02 \times 10^4 \text{ g mol}^{-1}$
- B. 10 g mol^{-1}
- C. $1.02 \times 10^6 \text{ g mol}^{-1}$
- D. $1.02 \times 10^4 \text{ g mol}^{-1}$
- E. $9.85 \times 10^4 \text{ g mol}^{-1}$

If your answer was:

- A: - you forgot to convert kPa to Pa
- B: - you forgot to convert from m³ to L
- C: - you converted to atm but used wrong R
- E: - you used $MW = m \times n$ and not $MW = m/n$



Assuming everyone is converting °C to K in 2nd level chem

Gwen Lawrie, September 2014



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Create change

Resourcing tensions

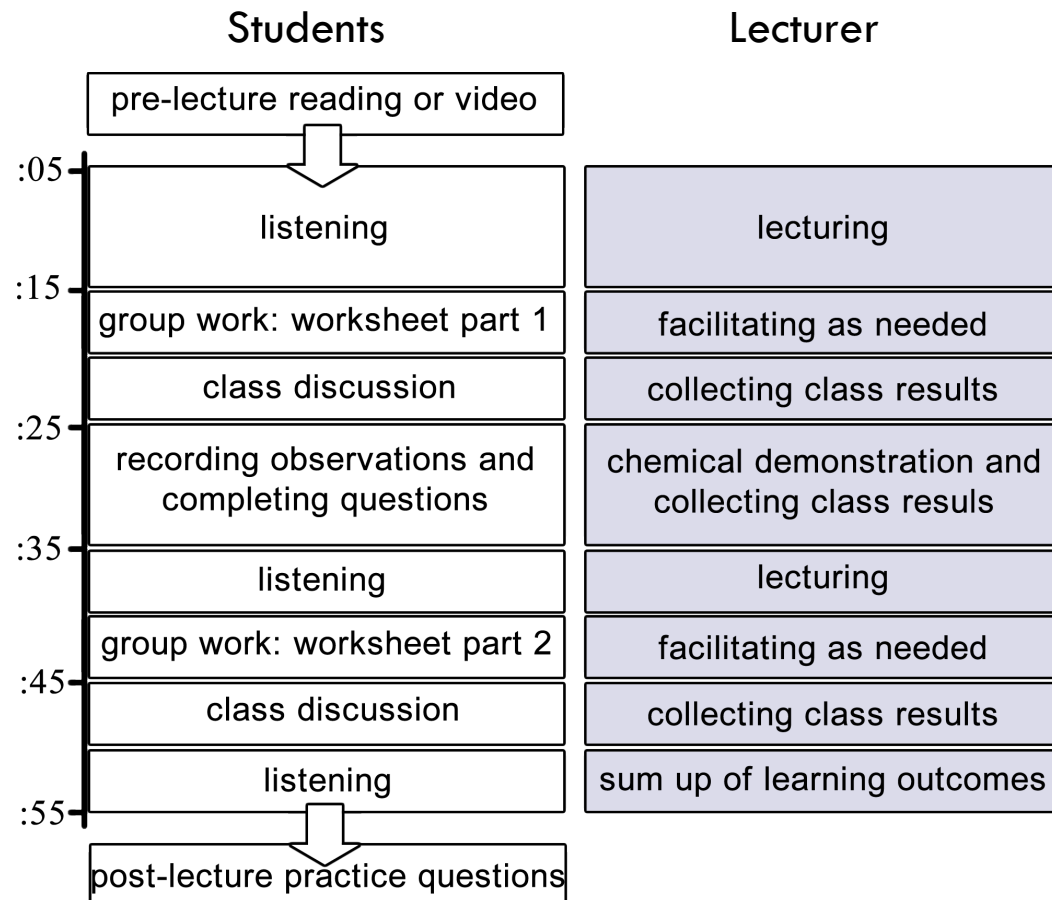


- Laboratory Learning
(Tutor marking)
- Teaching Team
(Sustained membership)
- PASS (tutorials)
(Attendance drops)
- Exam marking
(Short answer questions)

What 'ballast' is
dropped first?

Keeping the teaching consistent across a large cohort of students (2000+)

- Multiple streams of lectures
- 20+ lecturers with varying styles, engagement and experience




Preparation encourages participation (including attendance)

- Pre-lecture videos made with screen capture software
- Mastery quizzes which students can repeat (& repeat & repeat)

Atomic symbol - cations


1. What is the systematic name for this compound?



☐ hex-2-yne
☐ hept-3-yne
☐ hex-3-yne
☐ hept,3,yne
☐ oct-3-yne

submit answer

1. What is the systematic name for this compound?



You chose (e) oct-3-yne

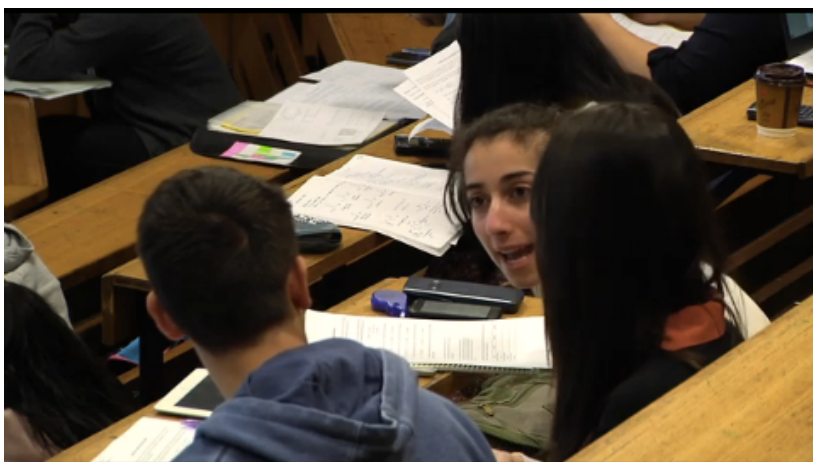
Incorrect!

This molecule contains a triple bond, so it is an alkyne and the name will end *-yne*. It has seven carbons, so the prefix is *hept-*. The triple bond is the third bond in the molecule, so we use the number *-3-* to indicate this. Note that when numbers about letters in a name, we use hyphens in between (not commas).

repeat question next question

Score = 0 / 10

Social and active face-to-face time



CHEM1001: Worksheet – Lecture 14

Model 1: Shells and sub-shells

The Bohr model of electron orbits (shells) is an over-simplification. In practice the shells are split into sub-shells, the number of sub-shells depending on the size of the shell. The Periodic Table reflects the sequential filling of sub-shells starting from the one closest to the nucleus.

Critical thinking questions

- Complete the table by indicating the maximum number of electrons that can fit into each sub-shell and shell

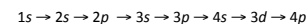
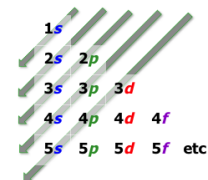
	s-sub-shell	p-sub-shell	d-sub-shell	Total number of electrons in shell
$n = 1$ shell				
$n = 2$ shell				
$n = 3$ shell				

- Which groups in the Periodic Table represent elements in which an s-sub-shell is being filled? This is the 's-block' of the Periodic Table.
- Which groups in the Periodic Table represent elements in which a p-sub-shell is being filled? This is the 'p-block' of the Periodic Table.
- Which groups in the Periodic Table represent elements in which a d-sub-shell is being filled? This is the 'd-block' of the Periodic Table.

Model 2: Electron configurations

We can label the sub-shells with a number which indicates the shell to which it belongs, a letter indicating the sub-shell and a superscript indicating the number of electrons present. So $2p^4$ indicates the second shell, the p-sub-shell and the presence of four electrons.

The sub-shells are filled from the most stable first, along the diagonals in the picture:



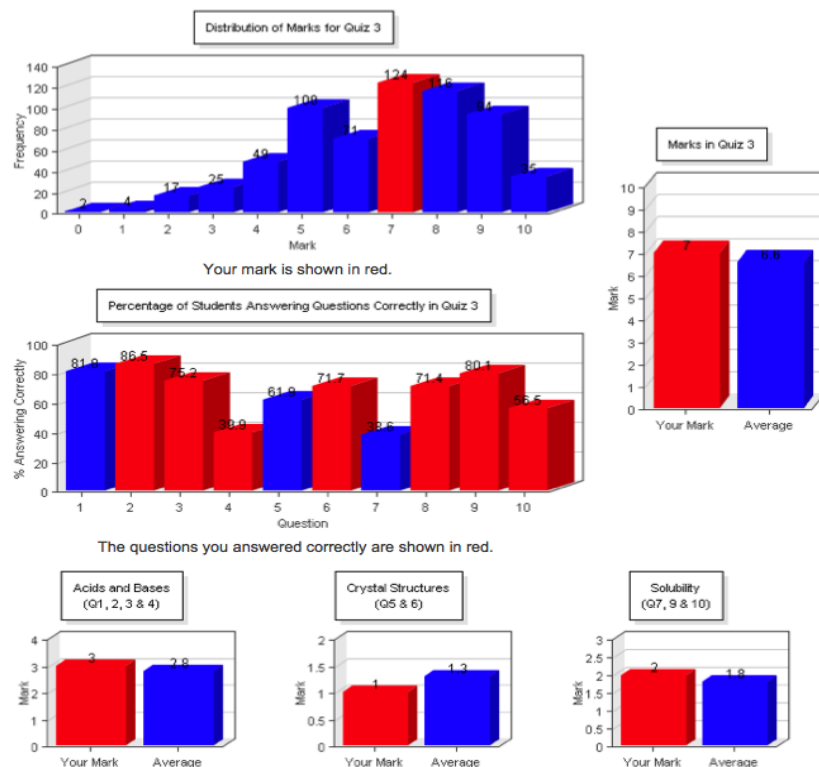
Critical thinking questions

- Write the electron configurations of the following atoms:

(a) B:	(b) C	(c) N
(d) O	(e) F	(f) Ne

Assessments designed to give personalised feedback

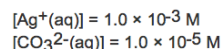
- 'Fast and personal feedback' on in class MCQ quizzes and assignments
- Students emailed individual report, feedback and feedforward advice



10. The ionic product, Q , has the same form as the solubility product, K_{sp} but the concentration are not usually equally to the equilibrium values. Instead, Q allows us to predict whether the substance will precipitate or dissolve more solid:

- If $Q < K_{sp}$ then more solid will dissolve and the ions in solution will *not* precipitate.
- If $Q > K_{sp}$ then precipitation will occur to reduce the concentration of the ions in solution.
- If $Q = K_{sp}$ then the system is already at equilibrium and no further dissolution or precipitation will occur.

After mixing, the total volume of the solution is 500.0 mL. As the volume occupied by Ag^+ and by CO_3^{2-} are both doubled, their concentrations are both halved:



The ionic product has the same form as K_{sp} :

$$Q = [Ag^+(aq)]^2[CO_3^{2-}(aq)] = (1.0 \times 10^{-3})^2(1.0 \times 10^{-5}) = 1.0 \times 10^{-11}$$

As $K_{sp} = 8.1 \times 10^{-12}$,

$Q > K_{sp}$ and precipitation occurs.

The correct answer is A. You answered B.

Questions 7, 9 and 10 covered quantitative solubility. You got 1 of these correct.

Alongside your lecture, critical thinking and homework tutorial notes from week 11, you should look at the ChemCAL tutorials on solubility:

<http://chemcal.chem.usyd.edu.au/S4Equilibria/SolubilEqm/SolubilEqm.html>

There are also additional resources in 'Course Resources' on eLearning, including textbook references and detailed learning outcomes. Follow the link to 'Resources organised week by week' for week 11 on eLearning, or go directly to:

<http://firstyear.chem.usyd.edu.au/chem1102/resources.shtml?week=11w>

Personalised learning

Contributed Links and Resources

Resources selected for you

Carboxylic Acids and Derivatives

- [Organic Acids and Bases](#)
- [Reduction and Oxidation](#)

Strong Acids and Bases

- [Acids and bases - self learning questions \(1\)](#)
- [pH of Strong Acids and Bases](#)

Weak Acids and Bases

- [Calculations with Weak Acids and Bases](#)
- [Weak Acids and Bases](#)
- [Acids and bases - self learning questions \(2\)](#)

Calculations Involving pK_a

- [Acid-Base Titrations](#)
- [Acids and bases - self learning questions \(3\)](#)
- [Acids and bases - self learning questions \(4\)](#)

Crystal Structures

- [Crystal Structures](#)

Solubility Equilibrium

- [Solubility equilibria](#)
- [Solubility - Self Learning Questions](#)

To access ChemCAL resources, use the username "1102" and the password "helium".
These resources have been selected for you based on your answers in tutorial quizzes.

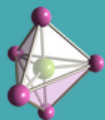
Most Popular Resources This Week



How am I doing and how can I improve?
(updated with quiz 3 results)



quick to



Unit Outline

Syllabus, learning outcomes and assessment information and dates.

Week 9

[Adam Bridgeman's resources for this week](#)

Tweets

Follow



First Year Chemistry @SydneyCHEM1102
Answers to Homework Problem Sheet 8
tinyurl.com/lczbf76

7 Oct



First Year Chemistry @SydneyCHEM1102
Homework Problem Sheet 9 tinyurl.com/kggrgf5n

7 Oct

Social learning online – switching from drop in support

plazza CHEM1102 9 Q & A Resources **Statistics** Manage Class

week_2 week_3 week_6 week_7 week_10 week_11 week_12 week_13 quiz_3 past_exam_questions_from_2006 past_exam_questions_from_2007 past_exam_questions_from_2008

Updated Unresolved Following

New Post Search or add a post...

RESOURCES

- Course Resources
- Laboratory Resources
- Pre-lab quiz marks
- Spectroscopy Problems
- Solving A
- Lecture Resources
- EchoCent
- HELP
- Discussion
- Piazza discussion fo
- FAQ
- Course Evaluation a
- Feedback
- External Resources
- SCIENCE COMMUNITY
- First Year Science eCommunity
- Faculty of Science Information for Students
- UNIT OF STUDY MANAGEMENT
- Control Panel

Thanks! 11/10/14
I wanted to say a big thank you to the instructors of this course for being so helpful all semester, encouraging us to
• **An instructor thinks this is a good note**

2011MCQ 11/9/14
In question two, it asked which of the compounds react with NaOH in acid base reaction, why the answer is B? Because wha

What is the ground state electron conf... 11/9/14
Why is it [Ar] 4s0 3d5? do electrons come from the s shell first and then the d shell?
<https://scilearn.sydney.edu.au>

reagents 11/9/14
Hi, How do the 2 reagents work in this image?
Screen_Shot_20141109_at_9.48.37_pm.png

Instr Best wishes for the examina... 11/9/14
Very best wishes and fortune to everyone for tomorrow's exam, and for all of your other papers too. Last minute tip

2013-N-5 11/9/14
For these metal complex, how do I know which atoms are attached to the transition metal? For example in the first compou

CHEM1102 Statistics (Get class statistics as a CSV file) (CHEM1102 Piazza Report) (Bulk download statistics)

Usage Trends For CHEM1102

users

Unique users per day

Personalising support using data

subject CHEM1001 lecture quiz 1

body

Source

B *I* U ~~S~~ x_2 x^2 I_x $\frac{1}{2}$ $\frac{3}{2}$ $\frac{1}{2}$ $\frac{3}{2}$

Format Font Size A

Dear \$PREFERREDNAME\$,

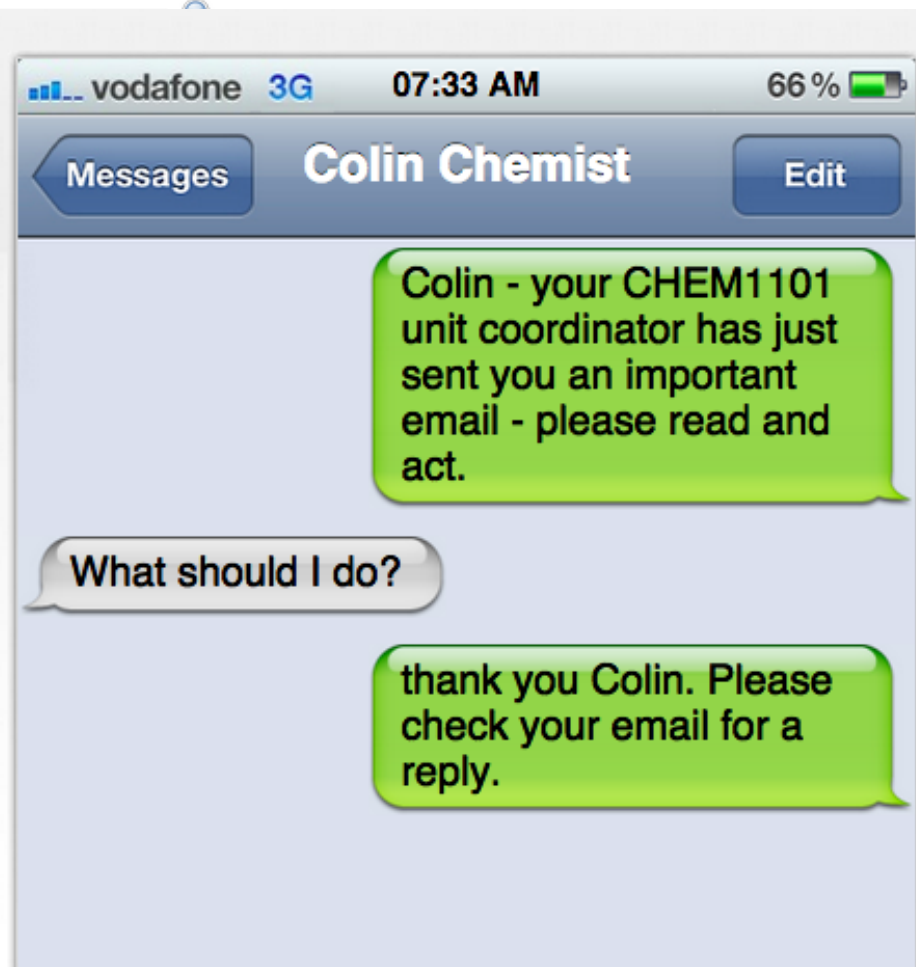
Thank you for completing the first lecture quiz ('A' your mark! The quizzes do get harder but I hope building the basics of each topic.

You can review your marks and go through any quizzes again for practice as you go through the resources, including ChemCAL modules and suggestions via the 'This Week' tile or via 'Course Resources'.

Don't forget that the CHEM1001 discussion forum is open every day and that there is a tutor available from 1-2pm every semester in the Learning Centre at the back of L1. We welcome your feedback on problems with the course. We welcome your feedback on your learning experience.

Best wishes,

Adam



The student response

“I actually genuinely looked forward to and was excited to attend (unlike most other classes I've taken this year).”

“.... so good I'm considering changing my degree to organic chemistry or biochemistry.”

“They're great at keeping the subject matter interesting and make understanding the concepts super easy”

“Keeps me on task throughout semester and means I come to lectures with a head start”

“Creative and interactive environment that is engaging to learn in.”

from mid-semester survey, conducted September 2015

CHEM1001 – results 2008 – 2014

