









Sebastian Schlücker

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Quiz: Five Advantages (ARS = Audience Response System)

- Activation of Students (game, competition, explicit answer)
- Anonymity ("Unfortunately, nobody will know how smart I am")
- Feedback on State of Knowledge (Students & Lecturer)
- Internal Comparison with Peer Group (Students)
- Reflection on Learning Objectives and Focus (Lecturer)

Which Categories of Questions? (STEM Perspective)

- 1. Definitions (Technical Terms, Physicochemical Quantities)
- 2. Qualitative Understanding (Concepts)
- 3. Quantitative Understanding (Equations/Proportionalities)
- 4. Estimations (Mental Arithmetics)

Quiz Participation: Internet Connection Required (WiFi or mobile data)

Open Your Web Browser and go to the Website VOte.ac ! It looks like this:



Your ID field should then look like this:



Getting Started: Test Run

Answer D is correct, while answers A, B and C are wrong.

Which answer is correct? Choose A, B, C or D AFTER the voting started!

- A. Answer A is correct
- B. Answer B is correct
- C. Answer C is correct

D. Answer D is correct



Please wait for instructions before voting !

Umfrage zurücksetzen

ID = Schluecker 54 Teilnehmer

$I_{\rho\sigma}^{if} = c_2 \omega^4 N I_0 \left| \alpha_{\rho\sigma} \right|^2$

Please wait until voting has been started !

You change the laser excitation wavelength from 1064 nm (Nd: YAG fundamental) to 532 nm (frequency-doubled). The laser power is the same in both cases and the spectrometer/CCD system has the same sensitivity at 532 and 1064 nm. We also neglect the role of molecular electronic resonances (i.e. conventional Raman scattering, not resonance Raman scattering)

By which factor does the Raman intensity change?

- A) 4-fold increase
- **B) 16-fold increase**
- C) **4-fold decrease**
- D) 16-fold decrease



Umfrage zurücksetzen

ID = Schluecker 65 Teilnehmer

$$\mu = \alpha_0 E_0 \cos \omega_0 t + \frac{1}{2} \left(\frac{\partial \alpha}{\partial q} \right)_0 q_0 E_0 \cos \left(\omega_0 - \omega_R \right) t + \frac{1}{2} \left(\frac{\partial \alpha}{\partial q} \right)_0 q_0 E_0 \cos \left(\omega_0 + \omega_R \right) t$$

Which requirement applies to vibrational Raman scattering?

- (1) Molecule must have permanent dipole moment
- (2) Change of electric dipole moment when passing through the equilibrium position
- (3) Change of polarizability when passing through the equilibrium position
- (4) Molecule must be polarizable









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Which normal modes of CO₂ are Raman-active?



Resonance Raman scattering (RRS): Which laser excitation wavelengths for selectively exciting i) Aml/II/III ii) Heme iii) Tyr/Trp ?



Aml/II/III Heme Tyr/Trp			
	i)	ii)	iii)
A)	266	633	325
B)	197	419	229
C)	229	419	197
D)	419	785	532



Umfrage zurücksetzen

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Slides for Download after WITec Workshop here:



