



**CONCORSO PUBBLICO, PER TITOLI ED ESAMI, A N. 1 POSTO DI CATEGORIA C - AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI, CON RAPPORTO DI LAVORO SUBORDINATO A TEMPO INDETERMINATO PRESSO L'UNIVERSITÀ DEGLI STUDI DI MILANO - DIPARTIMENTO DI CHIMICA DA RISERVARE, PRIORITARIAMENTE, ALLE CATEGORIE DI CUI AL DECRETO LEGISLATIVO N.66/2010 - CODICE 21939**

La Commissione giudicatrice del concorso, nominata con Determina Direttoriale n. 1208 del 2.2.2022, composta da:

|                             |            |
|-----------------------------|------------|
| Prof.ssa Prati Laura        | Presidente |
| Dott. Dal Santo Vladimiro   | Componente |
| Dott.ssa Feni Lucia         | Componente |
| Dott. Aiello Giovanni Marco | Segretario |

comunica i quesiti relativi alla prova orale:

#### GRUPPO QUESITI NUMERO 1

1. Preparazione del campione per le analisi NMR
2. Aspetti di sicurezza legati alla spettroscopia FT-IR
3. Leggere e tradurre: An experiment to match five white solids with ascorbic acid, citric acid, potassium hydroxide, sodium chloride, and urea is reported here. This 4 h experiment is an integrated practice of two experimental techniques, calorimetry and titration. Students conduct an extensive literature search on the properties of the five compounds and plan the experiment before the laboratory hours.

#### GRUPPO QUESITI NUMERO 2

1. Preparazione del campione per le analisi IR
2. Aspetti di sicurezza legati alla spettrometria NMR
3. Leggere e tradurre: Calorimetric results are used to identify potassium hydroxide, sodium chloride, and urea out of the five compounds. Acid-base titration is used to differentiate between the two weak acids and confirm the identity of the only base in this experiment. Additional calculations based on titration results can reveal waters of crystallization in citric acid and potassium hydroxide.

#### GRUPPO QUESITI NUMERO 3

1. Preparazione del campione per le analisi UV-Vis
2. Aspetti di sicurezza legati alla spettroscopia di assorbimento atomico
3. Leggere e tradurre: Morphology-dependent properties are significant in chemistry and material sciences. This laboratory experiment, designed for upper-division undergraduates in chemistry and related majors, emphasizes the concepts of the shape-controlled synthesis of crystal particles and the influences of crystal particle morphologies on their reaction performances. Cu<sub>2</sub>O particles with different morphologies, cubic and truncated octahedral, were synthesized under mild conditions. The resulting products were examined with XRD and SEM to characterize their phase components and surface morphologies.

#### GRUPPO QUESITI NUMERO 4

1. Preparazione del campione per le analisi in spettroscopia atomica
2. Aspetti di sicurezza legati alla spettrometria di massa
3. Leggere e tradurre: The activity differences of these products in the reduction of ferric thiocyanate solution, K(n-3)[Fe(SCN)<sub>n</sub>], were measured and compared. The truncated octahedral Cu<sub>2</sub>O particles showed higher activity than the cubic ones, which is attributed to differences in their shapes and exposed facets. This experiment can help undergraduates realize that the performances of crystal particles are related not only to their structures and dimensions but also to their morphologies.



## GRUPPO QUESITI NUMERO 5

1. Preparazione del campione per le analisi in spettrometria di massa
2. Aspetti di sicurezza legati alla spettroscopia UV-Vis
3. Leggere e tradurre: Chemistry scholars and educators are intentionally creating inclusive curriculum and equitable learning opportunities in response to the inequities in society exposed by the challenges of discrimination and the pandemic over the last few years. This special issue on "Diversity, Equity, Inclusion, and Respect in Chemistry Education Research and Practice" shines a light on discipline-based education research in chemistry that addresses diversity, equity, inclusion, and respect in classrooms, on campuses, and in the broader chemical discipline.

Milano, 16.3.2022

La Commissione

Prof.ssa Prati Laura - Presidente

Dott. Dal Santo Vladimiro - Componente

Dott.ssa Feni Lucia - Componente

Dott. Aiello Giovanni Marco - Segretario