

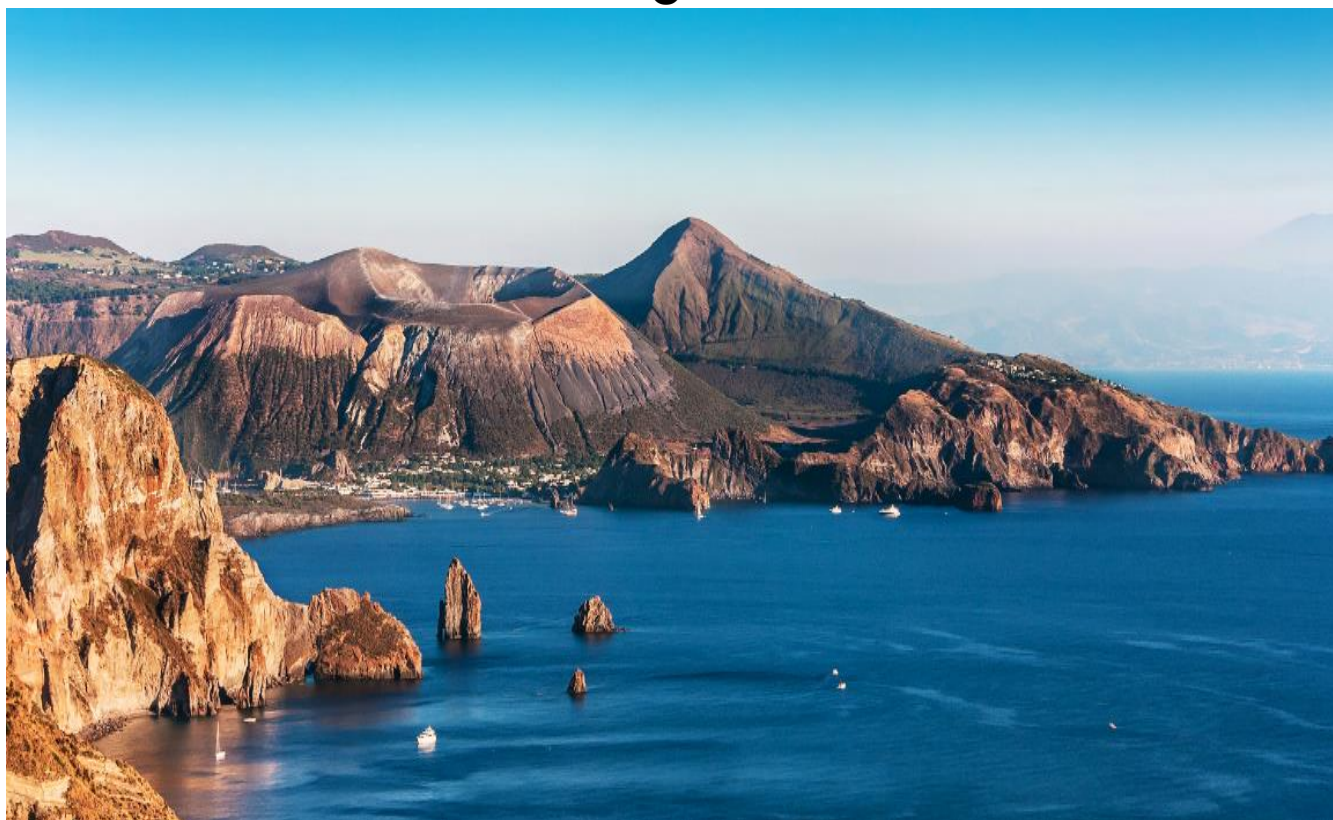
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per Ingegneria

VIII Workshop Nazionale AICIng 27-29 Giugno 2019



**“ADVANCED MATERIALS FOR SUSTAINABLE ENERGY,
ENVIRONMENT AND SENSING APPLICATIONS”**

ATTI DEL CONVEGNO

17:30	POSTER SESSION 	
20:00	Cena Sociale tipica Eoliana	
Sabato 29 Giugno 2019		
SESSIONE 5: Chairperson Piero Mastrorilli		
09:30	O18	<i>“BaCe0.65Zr0.20Y0.15O3-δ-Ce0.85Gd0.15O2-δ composite: a MIEC ceramic membrane for H₂ purification”</i> Cecilia Mortalò , E. Rebollo, S. Escolástico, J. M. Serra, C. Leonelli, M. Fabrizio
09:45	O19	<i>“Electrospinning and photo-crosslinking of rubber nanofiber membranes”</i> Alessandra Vitale , Roberta Bongiovanni
10:00	O20	<i>“Evaluation of Cardiac Fibroblast Activation via Traction Force Microscopy”</i> Pamela Mozetic , Andrea Zanca, Monica Orsini, Marcella Trombetta, Giancarlo Forte, Alberto Rainer
10:15	O21	<i>“Bio-based composites from natural pectins and hemp fibers as novel carriers of green pesticides for agricultural applications”</i> Gianluca Viscusi , Giuliana Gorrasi
10:30	O22	<i>“Nanocellulose: an innovative eco-sustainable resource”</i> Laura Riva , Nadia Pastori, Andrea Fiorati, Massimo Cametti, Alessandro Sacchetti, Carlo Punta
10:45	O23	<i>“Poisoning tolerance of platinum-group-metal-free catalysts for the oxygen reduction reaction”</i> Valerio C.A. Ficca , Barbara Mecheri, Carlo Santoro, Alessandra D’Epifanio, Silvia Licoccia, Plamen Atanassov
		
SESSIONE 6: Chairperson Fabio Ganazzoli		
11:30	O24	<i>“Evaluation of NiO-SCCNTs core-shell structure; new insight into shell thickness effect on gas sensing properties”</i> Kaveh Movlaee , Giovanni Neri
11:45	O25	<i>“In vitro antiproliferative and antibacterial activities of sol-gel materials containing different amount of CGA”</i> Elisabetta Tranquillo , Federico Barrino, Michelina Catauro
12:00	O26	<i>“C₃N₄ for CO₂ photoreduction: catalyst performance and stability in batch and continuous reactor”</i> Francesca Rita Pomilla , Giuseppe Marcì, Elisa Isabel Garcia Lopez, Giuseppe Barbieri, Adele Brunetti, Raffaele Molinari, Leonardo Palmisano
12:15	O27	<i>“β-glucosidase immobilization into mesoporous silica nanoparticles: the effect of pore size and morphology”</i> Aniello Costantini, Valeria Califano, Brigida Silvestri, Virginia Venezia , Filomena Sannino, Antonio Aronne
12:30		Premiazioni
12:45		e Chiusura dei lavori

C₃N₄ for CO₂ photoreduction: catalyst performance and stability in batch and continuous reactor

Francesca Rita Pomilla,^{1,2} Giuseppe Marci,¹ Elisa Isabel Garcia Lopez,³ Giuseppe Barbieri,⁴ Adele Brunetti,⁴ Raffaele Molinari,² Leonardo Palmisano¹

¹ “Schiavello-Grillone” Photocatalysis Group. Department of Engineering, University of Palermo, Viale delle Scienze, 90128 Palermo, Italy

² Department of Environmental and Chemical Engineering, University of Calabria, Via Pietro Bucci, Rende CS 87036, Italy

³ Department of Biological, Chemical and Pharmaceutical Sciences and Technologies (STEBICEF), University of Palermo, Viale delle Scienze, 90128 Palermo, Italy

⁴ Institute on Membrane Technology (ITM-CNR), National Research Council, c/o University of Calabria, Cubo 17C, Via Pietro Bucci, Rende CS 87036, Italy
Email: francescaritapomilla@gmail.com

The increase of CO₂ is causing the climate change promoting the global warming.[1] Photocatalysis is an eco-friendly process where a semiconductor under irradiation can transform CO₂ to fuel. Recently, C₃N₄ was identified as a promising photocatalyst for CO₂ photoreduction.[2] In this study, various C₃N₄ samples were prepared and characterized. CO₂ photoreduction was carried out by using C₃N₄ as powder and coated on glass support in a batch reactor or embedded in a Nafion membrane in a continuous reactor. In all cases, aliquots of the reaction mixture at different irradiation times were analysed by GC. CO₂ photoreduction occurred giving CO, CH₄, MeOH, EtOH and HCOH, the main products depending on the experimental conditions. In particular, the reactor containing C₃N₄ as powder produced CH₄ as the main product.[3] The glass supported photocatalyst, instead, produced only CO, but a photocorrosion of C₃N₄ occurred during the photocatalytic test.[4] The best C₃N₄ performances were obtained in the continuous membrane reactor.[5] These results indicate that the efficiency of C₃N₄ for CO₂ photoreduction strongly depends on the type of reactor and the experimental conditions adopted.

References

- [1] M. R. Allen, D. J. Frame, C. Huntingford, C. D. Jones, J. A. Lowe, M. Meinshausen, N. Meinshausen. *Nature* **2009**, *458*, 1163-1166.
- [2] J. Wen, J. Xie, X. Chen, X. Li. *Appl. Surf. Sci.*, **2017**, *39*, 72-123.
- [3] F. R. Pomilla, R. Molinari, E. I. García-López, G. Marci, L. Palmisano. *Research and Technologies for Society and Industry (IEEE-RTSI)*, ISBN: CFP18C29-ART, Part Number: 978-1-5386-6286-3, **2018**, 478-483
- [4] F. R. Pomilla, M. A. L. R. M. Cortes, J. W. J. Hamilton, R. Molinari, G. Barbieri, G. Marci, L. Palmisano, P. K. Sharma, A. Brown, J. A. Byrne. *J. Phys. Chem. C*, **2018**, *122*, 28727-28738.
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