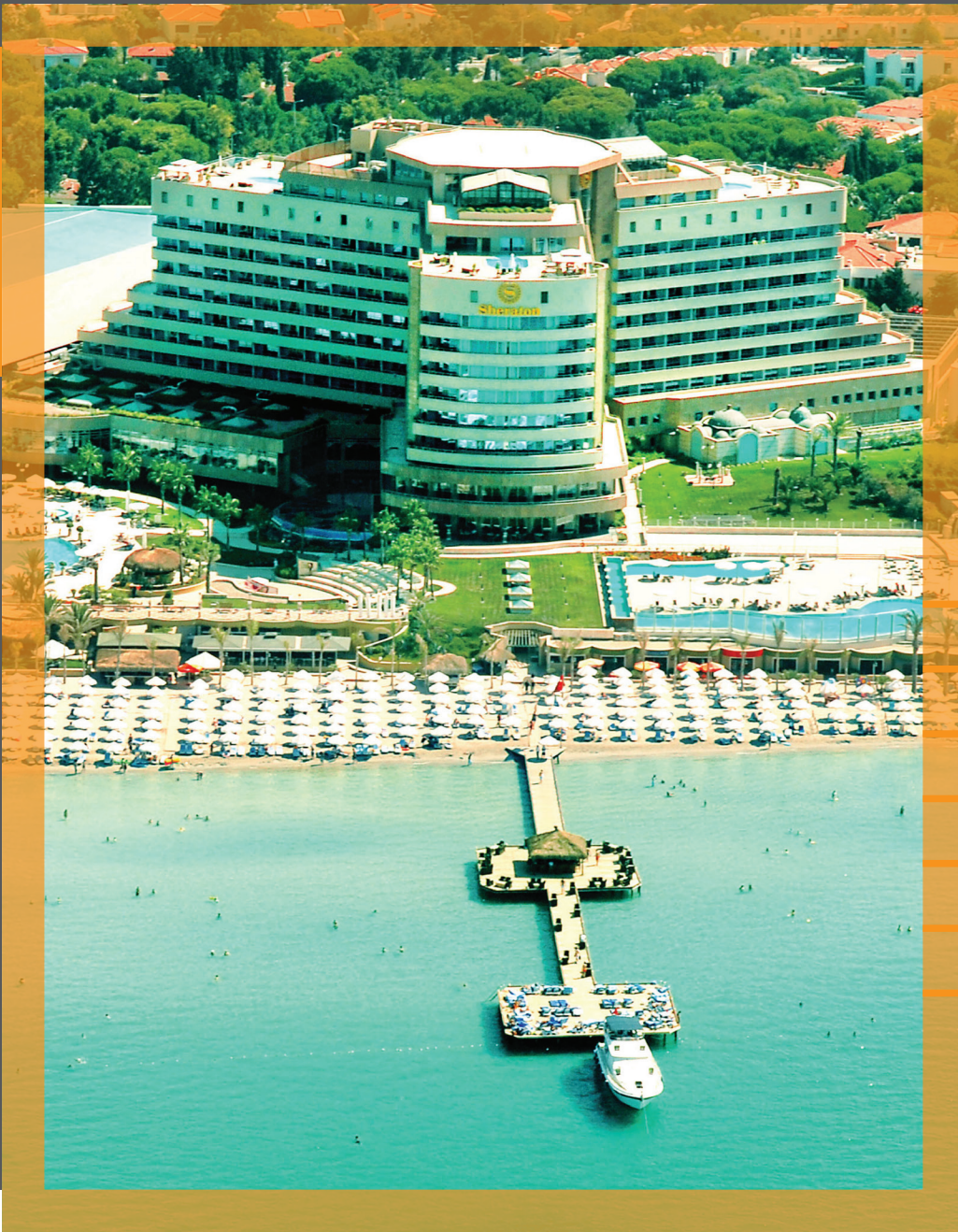




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INTERNATIONAL POROUS POWDER MATERIALS

SYMPOSIUM & EXHIBITION



PPM 2013

3-6
September

MAIN THEMES:

- **Theme A:** Development and Characterization
- **Theme B:** Catalytic Aspects
- **Theme C:** Environmental and Hygienic Aspects
- **Theme D:** Biological and Medical Aspects
- **Theme E:** Transport and Surface Chemistry
- **Theme F:** Modeling and Simulation
- **Theme G:** Industrial Applications

Proceedings: Full papers submitted will be printed in the Symposium Proceedings Book.

VENUE

The symposium will be held in Sheraton Hotel Resort & Spa in Izmir-Cesme-Turkey. Register now and enjoy the low registration and hotel rates.

organizing

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Paolo COLOMBO / Univ. of Padova, ITALY
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Muharrem KAPLAN / Adacal Industrial Minerals, TURKEY
Carl LEVOGUER / Malvern Instruments Ltd., UK
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José RIVAS / Int'l Iberian Nanotech. Lab., PORTUGAL
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Matthias THOMMES / Quantachrome Corp., USA
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Symposium's official Organizing agency is ALBEDO Tourism



PPM 2013 International Porous and Powder Materials Symposium and Exhibition,
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POSTER PRESENTATIONS (Updated 25/08/2013)

| ID | Title | Name | Institution | Country |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------|--------------------|
| 5 | POROUS SILICON: Determining the Critical Anodisation Current | Şafak Doğan | gazi university | Turkey |
| 10 | Theoretical study of thiol-silica-cisplatin interactions | Andres Diaz Compañy | UNS, UTN | Argentina |
| 11 | Sulfurization of activated carbon with sulfur dioxide in a fluidized-bed furnace | Tahereh Kaghazchi | Amirkabir University of Iran | Iran |
| 12 | Microstructure and characterization of B4C reinforced Al2024 alloy matrix composites produced by mechanical alloying technique | Aykut Canakci | Karadeniz Technical University | Turkey |
| 13 | Artificial neural network approach to predict of effect of process control agent on the microhardness of Al-Al2O3 composite powders produced by mechanical alloying | Aykut Canakci | Karadeniz Technical University | Turkey |
| 15 | Fabrication of Fe–Al intermetallic coatings using mechanical milling technique | Aykut Canakci | Karadeniz Tecnical Universty | Turkey |
| 16 | Abrasive wear behavior of powder metallurgy CuSn10-graphite metal matrix composites produced by powder metallurgy | Aykut Canakci | Karadeniz Technical University | Turkey |
| 17 | Application of Oxidized and Reduced Activated Carbon for para-nitrophenol removal | Tahereh Kaghazchi | Amirkabir university of technology | Iran |
| 19 | EFFECT OF THE BINARY AND TERNARY EXCHANGES ON CRYSTALLINITY AND TEXTURAL PROPERTIES OF X ZEOLITES | HABIB HAMMOUDI | UNIVERSITY OF MOSTAGANEM | Algeria |
| 22 | Isomerisation of paraffins nC10-nC17 OVER Pt/H-Halloysites | Ahmed BELHAKEM | Dept Chemistry, F.S.E&I/U. Mostaganem | Algeria |
| 23 | Adsorption studies of lead ions from wastewater using waste foundry sand | Semra Çoruh | Ondokuz Mayıs University, Departement of Environmental Eng. | Turkey |
| 24 | Relation Between Rheological Properties and Pore Structure of the Fly ash/Cement Based AAC Mortar and Product Properties | M.Serhat Başpınar | Afyon Kocatepe University | Turkey |
| 27 | Study of desorption in a saturated clay with nitrogen of medium fraction of petroleum | Marco Figueiredo | Universidade do Estado do Rio de Janeiro | Brazil |
| 28 | Influence of Surface Chemistry on β -galactosidase from Kluyveromyces Lactis immobilisation onto Cellulose Acetate Microfiltration Membrane | Hacı Ali GÜLEÇ | Trakya University | Turkey |
| 29 | Hydrogen Storage on M1+-ZSM-5 Clusters (M = K, Li and Na) | Mehmet Ferdi FELLAH | Bursa Technical University | Turkey |
| 30 | Effect of pore wall microstructure on the mechanical properties of low alloy steel foams | Nuray Beköz | Istanbul University, Engineering Faculty, Metallurgical and Materials Engineering Department | Turkey |
| 32 | Mechanical properties of sinter-hardened Cu-Ni-Mo based steels | Nuray Beköz | Istanbul University, Engineering Faculty, Metallurgical and Materials Engineering Department | Turkey |
| 33 | The effect of the porous Bentonite-AlCrNi material in the turbine efficiency preservation | Mokhtar BOUNAZEF | Djillali Liabes University of Sidi Bel Abbes | Algeria |
| 36 | Analysis of Swelling Behaviour of Clay Minerals by Discrete Numerical Simulation | hamed bayesteh | Univercity of Tehran | Iran |
| 40 | Loaded polymer foam material for microwave absorption | Ratiba BENZERGA | IETR | France |
| 41 | Microwave absorbing properties of reinforced foam-glasses designed for building industry | Ratiba BENZERGA | IETR | France |
| 43 | Simulation of Micro-permeability during solidification of Al-3%Si mushy alloy as a dynamic porous media | sadegh firoozi | amirkabir University | Iran |
| 44 | Kinetic sudy of major components and antibacterial activity of the | Nafila Zouaghi | Ecole Normale Supérieure Kouba | Algeria |
| 45 | Electromagnetic wave absorption properties of Magnetic Nanowires Growth in Nanoporous Anodic Alumina Template | Majid Ebrahimzadeh | Behin Sanaat Yam Company, Saad | Iran |
| 46 | THE EFFECT OF FLY ASH AND MICRO – SILICA ON CONCRETE QUALITY IN PRODUCTION OF CONCRETE | SULEYMAN ULUOZ | ILGAZ INSAAT | Turkey |
| 47 | The role of the zeolite structure on the catalytic performance in gas-phase phenol oxidation by N2O | Larisa Pirutko | Boreskov Institute of Catalysis | Russian Federation |

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|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| 485 | Synthesis and characterization of SiC / Al MMCs by powder metallurgy | Onur Fevzi KEVENLİK | Kırıkkale University | Turkey |
| 486 | Synergistic effects of HPC and SDS on fast redispersion and dissolution of fluidized bed and spray dried drug nano-composite powders | Rajesh Dave | New Jersey Institute of Technology | United States |
| 487 | Atmospheric pressure synthesis of mesoporous silica (MCM-41 and HMS) for catalytic application in biodiesel production | Tahere Mohamadpanah | Materials and energy research center | Iran |
| 489 | Biodegradation of Phenol by pseudomonas spp | zoubida bendjama | laboratoire sciences du génie des procédés, faculté de génie mécanique et génie des procédés, USTHB, | Algeria |
| 491 | Effect of flow field and geometry of regular scaffolds in cell culture parameters | Javad Etedadi | Sahand University of Technology, Mechanical Engineering Department, Biomechanics Group | Iran |
| 492 | Microporous polymer networks (MPNs) made in metal-free regimes – systematic optimization of a synthetic protocol towards N-arylcarbazole-based MPNs | Eduard Preis | Bergische Universität Wuppertal | Germany |
| 495 | Metal-Organic Frameworks as Sensor materials for selective Detection of Guest Molecules | Nicole Klein | Fraunhofer IWS Dresden | Germany |
| 496 | Characterization and Modification of Kaolinite with Pyridine and 2,6-Diamino Pyridine | BERNA KOÇER | BALIKESIR UNIVERSITY | Turkey |
| 497 | Monodisperse Porous Polymer Particles Containing N-Methyl-D-Glucamine Groups for Boron Removal from Geothermal Water by Hybrid Method | NALAN KABAY | Ege University | Turkey |
| 499 | Molecular Dynamics Simulation of Graphene Like Boron Carbide Nanoribbons Under Strain | Yusuf Şimşek | Vocational School of Health Service, Gazi University, Ankara | Turkey |
| 500 | Development of a New Nondestructive Method for Monitoring the Homogeneity of Pharmaceutical Powders | NADJET GUEMRAS | USTHB/CINAM-CNRS AIX MARSEILLE UNIVERSITY | Algeria |
| 502 | The Effect of Cooling Rate on the Characteristics of Unidirectionally Freeze-Casted Gelatin Scaffold | Ali Zamanian | Materials and Energy Research Center | Iran |
| 505 | Annealing of Co-Cr dental alloy: Effects on nanostructure and Rockwell hardness | Simel Ayyildiz | Department of Prosthodontics, Dental Health Sciences Center, Gülhane Military Medical Academy | Turkey |
| 506 | EFFECTS OF B4C ON ALUMINA-BASED CERAMIC FOAM FILTERS | Kerim Emre ÖKSÜZ | Cumhuriyet University | Turkey |
| 508 | The Effect of Composition and Cooling rate on Microstructure of Chitosan/Silk-fibroin Microtubular Ice-templated Porous Scaffold | Ali Zamanian | Materials and Energy Research Center | Iran |
| 509 | The Photocatalytic Activity of Ceria Doped Titania Catalysts in Methylene Blue Degradation and Glycerol Reforming | Mert Tunçer | Izmir Institute of Technology, Department of Chemical Engineering | Turkey |
| 510 | Improvement of HA bioceramics with addition of AW glass-ceramic | Fatih ÇALIŞKAN | Sakarya University | Turkey |
| 511 | Formulation and characterization of the microparticles containing the antihypertensives for pharmaceutical use | NADJET GUEMRAS | USTHB/CINAM-CNRS/AIX MARSEILLE UNIVERSITY/CRAPC | Algeria |
| 513 | The effect of waste marble powder on the fresh state and mechanical properties of self-compacting mortars | Çağlar Yalçınkaya | Dokuz Eylül University, Department of Civil Engineering | Turkey |
| 515 | Characterization and Increasing Porosity of Limestones; Kufeki | Sonmez Arslan | Batman University | Turkey |
| 516 | Use of microorganisms immobilized on graphite to remove lead from aqueous solution | Hassiba MOKADDEM | USTHB | Algeria |
| 517 | Recovery of isoamyl acetate from aqueous solution using macroporous adsorption resins | Murat Yılmaztekin | Inonu University | Turkey |
| 518 | Removal of mercury from aqueous solutions using composite nanomaterials of graphite oxide with chitosan and magnetic chitosan | Eleni Deliyanni | Laboratory of General & Inorganic Chemical Technology, Division of Chemical Technology, School of Chemistry, Aristotle University of Thessaloniki | Greece |



Removal of mercury from aqueous solutions using composite nanomaterials of graphite with chitosan and magnetic chitosan

G.Z. Kyzas, N.A. Travlou, E.A. Delivanni.

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ABSTRACT—In the current work, two novel forms of graphite oxide composites were prepared having as substrate chitosan. The first composite (GO-Ch) is a complex between graphite oxide (GO) and cross-linked chitosan (Ch), while the other composite (GO-Chm) is consisted of GO and magnetic chitosan (Chm). The magnetism occurred in the second case can strongly influence the properties of two polymers. A full characterization was achieved in order to study the properties of the composites synthesized. X-ray diffraction patterns revealed the crystallinity and possible degree of order. The elemental analysis of materials evaluated using energy dispersive X-ray analysis (EDX), while their morphology was observed with SEM. Also, TG analysis was realized revealing a significant difference in thermal behavior between the composites and the separate parts (GO and Ch/Chm). FTIR spectroscopy was used in order to explain, via the shift of peaks, the new interactions occurred in the composites. Then, the composite materials prepared were used in adsorption experiments to bind/remove Hg(II). The maximum adsorption capacity can reach 190 mg/g (GO-Ch) and 210 mg/g (GO-Chm) for the removal of mercury. Kinetics as well as desorption experiments were done. Five cycles of adsorption-desorption were carried out.

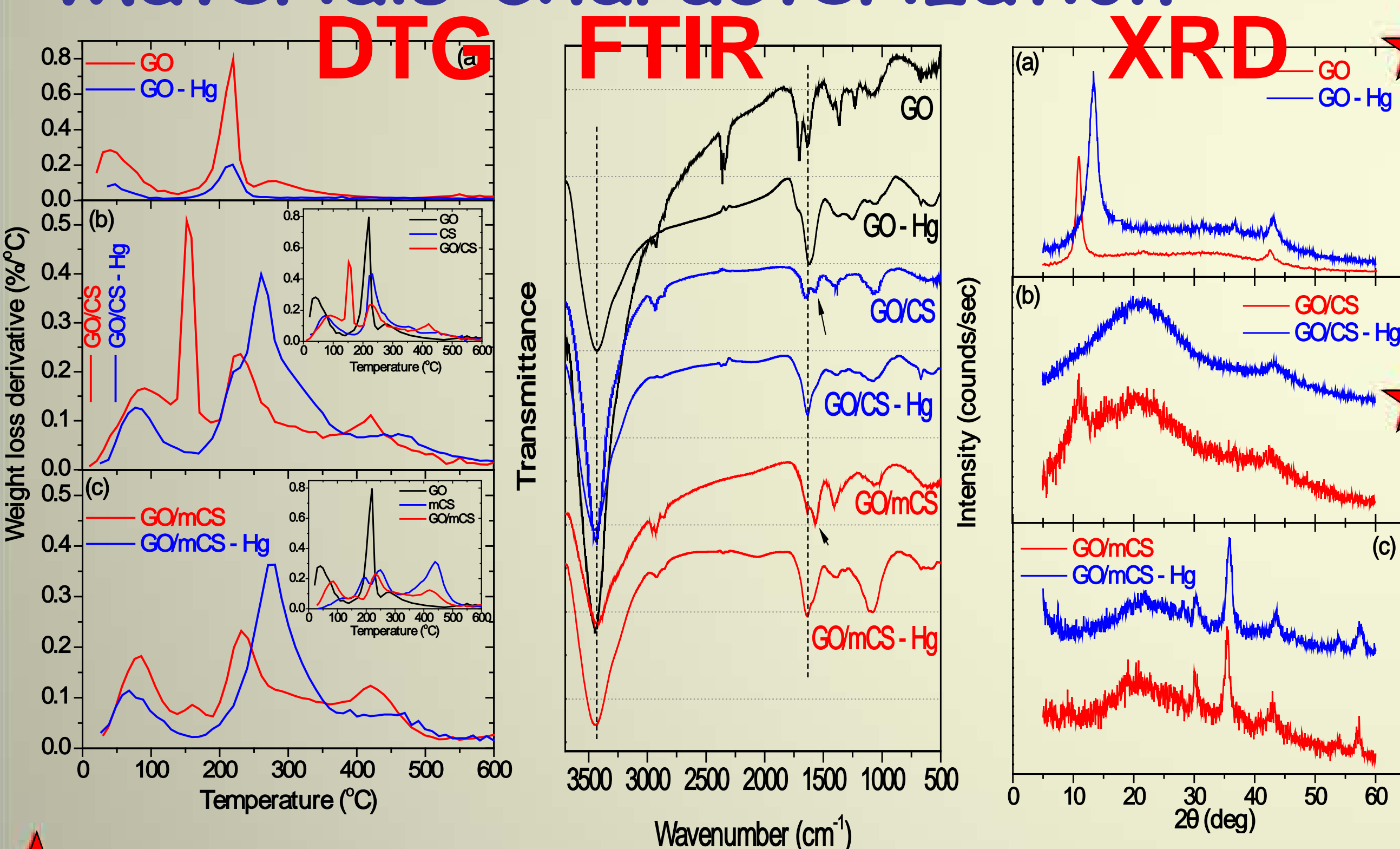
Materials preparation

GO was prepared according to Hummers method

CS was cross-linked with GLU

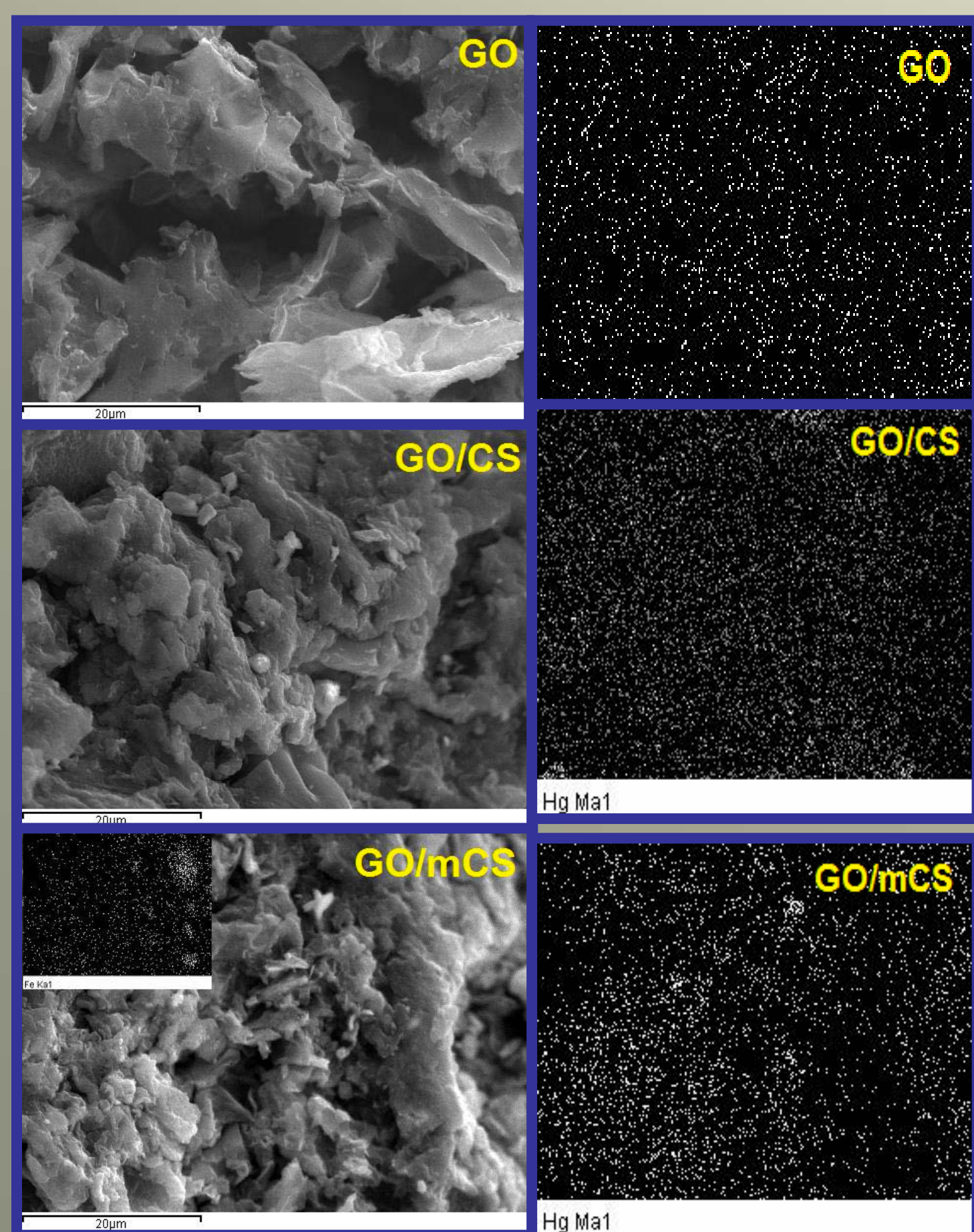
GO-C/CSm composite: CS/mCS solution (2% w/v) was prepared by dissolving of chitosan into acetic acid solution (2% v/v) under ultrasonic stirring for 2 h at room temperature. GLA were added to cross-linked chitosan. GO were added in the solution prepared and the mixed system was stirred for 90 min in a water bath at 50 °C and further 60 min at 80 °C. Black products were washed with ethanol and distilled water and dried in a vacuum oven at 50 °C.

Materials characterization



After Hg(II) adsorption onto GO, a decrease in the interlayer distance between carbon layers was observed, in line with the presence of

Hg⁰ onto surface.

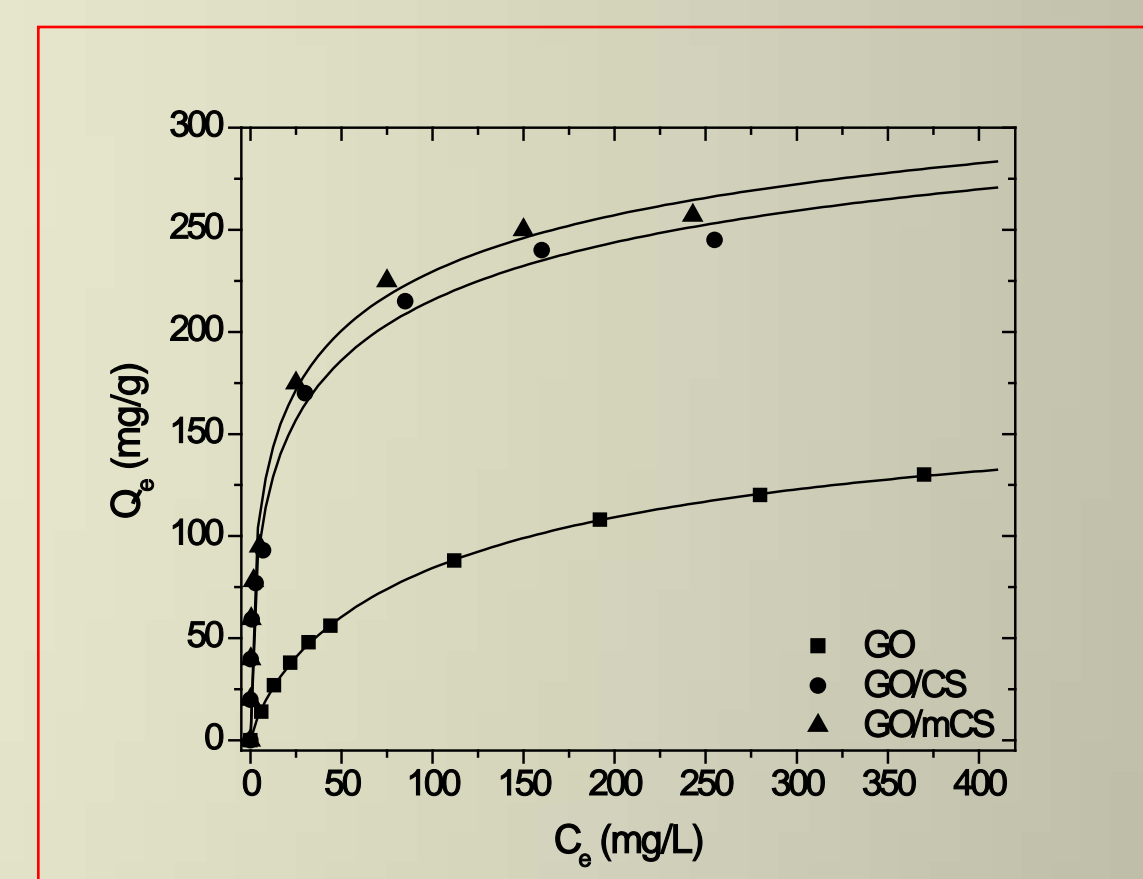
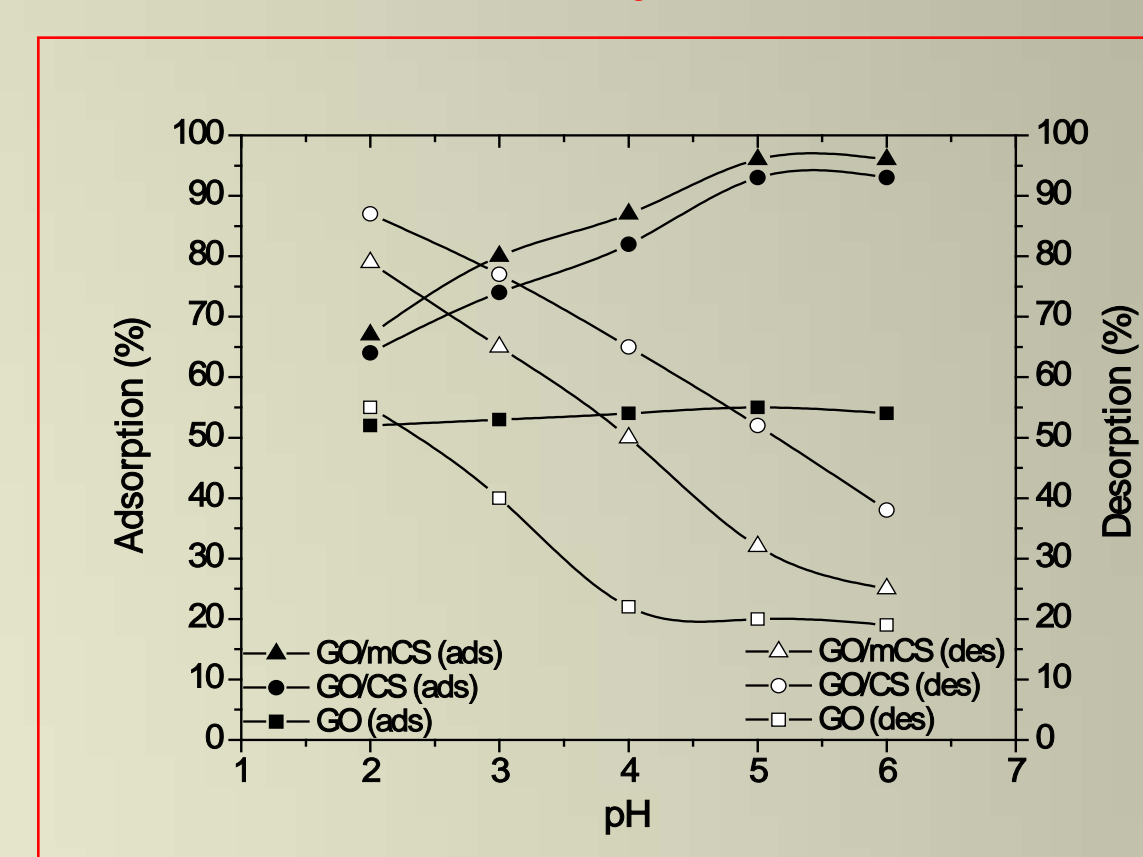


Exfoliation of GO layers after Hg(II) onto GO/CS. The exfoliation/destruction of the layered structure of GO during synthesis of GO/mCS indicating that carboxyl and epoxy groups between GO layers reacted with a significant part of the amino groups of mCS containing magnetic nanoparticles with a size bigger than that of its interlayer distance. After Hg(II) onto GO/mCS no other structural change was occurred.

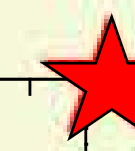
Proposed Hg(II) adsorption mechanism (via characterization and adsorption evaluation):

chelation between amino groups of CS and Hg(II). Possible interactions between oxygen atoms from carboxyl or hydroxyl groups of GO-based material and Hg(II) (especially at pH conditions where chelation does not favor).

Adsorption results



Adsorption behavior of GO/CS and GO/mCS was drastically influenced from pH conditions, while that of GO was unchanged.



Q_{max} of the initial material of GO (187 mg/g) was increased to 381 mg/g (GO/CS) and 397 mg/g (GO/mCS) mg/g. Increase of Q_{max} for all adsorbents with the increase of temperature.



Kinetics were fitted to the pseudo-second order equation (R²~0.999). Faster adsorption for GO/CS and GO/mCS (equilibrium after ~150 min), milder equilibrium

Adsorption mechanism

