

# Fereshteh Meshkani

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***Birthday:*** 12/09/1983

***Nationality:*** Iranian

## ***Education***

Ph.D. Chemical Engineering, University of Kashan, 2011-2015.

M.Sc. Chemical Engineering, University of Kashan, 2007-2010.

B.Sc. Chemical Engineering, Persian Gulf University, 2002-2006.

## ***Research Interests***

- Heterogeneous Catalysis & Porous Materials
- Natural Gas Catalytic Conversion & Processing
- Characterization and Application of Mesoporous Materials
- Nanocatalysis & Nanomaterials
- Water gas shift process

### ***Research Projects***

1. Synthesis of bi-metallic catalysts (Ni-Pt) supported on nanocrystalline MgO for methane reforming with carbon dioxide
2. Synthesis of MgAl<sub>2</sub>O<sub>4</sub> spinel and its application as carrier for dry reforming catalysts.
3. Design and manufacturing of catalytic evaluation setup for nano catalysts in laboratory scale (Cata-Test)
4. Design and manufacturing of temperature programmed analyses setup for heterogeneous catalysts (TPR-TPO-TPD)
5. Preparation of mesoporous nanocrystalline iron oxide catalysts for high temperature water gas shift reaction.
6. Preparation and evaluation of Cr- Free promoted iron based nanocatalysts with mesopores structure for hydrogen production via high temperature water gas shift reaction

### ***Graduate and Undergraduate Courses***

- Basic Principles and Calculations in Chemical Engineering
- Gas Processing
- Heat transfer I
- Nanomaterial synthesis methods

### ***Honors and Awards***

- Research Excellence Award in 2009, University of Kashan (Faculty of engineering).
- Ranked 1<sup>st</sup> among M.Sc. admitted students in Chemical engineering, University of Kashan, 2007
- Ranked 3<sup>rd</sup> GPA among all M.Sc. students of the whole Engineering Department, University of Kashan, 2007.
- Research Excellence Award in 2011, University of Kashan (Faculty of engineering).
- Ranked 1<sup>st</sup> among Ph.D. admitted students in Chemical engineering, University of Kashan, 2012

## *Publications*

### *❖ Journal publications*

1. **Fereshteh Meshkani**, Mehran Rezaei, Facile Synthesis of Nanocrystalline Magnesium Oxide with High Surface Area, *Powder Technology*, 196 (2009) 85–88.
2. **Fereshteh Meshkani**, Mehran Rezaei, Effect of process parameters on the synthesis of nanocrystalline magnesium oxide with high surface area and plate-like shape by surfactant assisted precipitation method, *Powder Technology*, 199 (2010) 144–148.
3. **F. Meshkani**, M. Rezaei, Nanocrystalline MgO supported nickel-based bimetallic catalysts for carbon dioxide reforming of methane, *International Journal of Hydrogen Energy*, 35 (2010) 10295-10301.
4. J. Safari, S.D. Khalili, M. Rezaei, S.H. Banitaba, **F. Meshkani**, Nanocrystalline magnesium oxide: A novel and efficient catalyst for facile synthesis of 2,4,5-trisubstituted imidazole derivatives, *Monatshefte für Chemie*, 141 (2010) 1339-1345
5. **Fereshteh Meshkani**, Mehran Rezaei, Nickel Catalyst supported on Magnesium oxide with High Surface Area and Plate-Like Shape: A Highly Stable and Active Catalyst in Methane Reforming with Carbon Dioxide, *Catalysis Communications*, 12 (2011) 1046-1050.
6. Mehran Rezaei, **Fereshteh Meshkani**, Aboulfazl Biabani, Behzad Nematollahi, Atiyeh Ranjbar, Narges Hadian, Zeinab Mosayebi, Autothermal reforming of methane over Ni catalysts supported on nanocrystalline MgO with high surface area and plated-like shape, *International Journal of Hydrogen Energy*, 36 (2011) 11712-11717.

7. **F. Meshkani**, M. Rezaei, Ni catalysts supported on nanocrystalline magnesium oxide for syngas production by CO<sub>2</sub> reforming of CH<sub>4</sub>, *Journal of Natural Gas Chemistry*, 20 (2011) 198-203.
8. Z. Mosayebi, M. Rezaei, N. Hadian, F. Zareie Kordshuli, **F. Meshkani**, Low temperature synthesis of nanocrystalline magnesium aluminate with high surface area by surfactant assisted precipitation method: Effect of preparation conditions, *Materials Research Bulletin* 47 (2012) 2154–2160.
9. N. Hadian, M. Rezaei, Z. Mosayebi, **F. Meshkani**, CO<sub>2</sub> reforming of methane over nickel catalysts supported on nanocrystalline MgAl<sub>2</sub>O<sub>4</sub> with high surface area, *Journal of Natural Gas Chemistry*, 21 (2012) 200-206.
10. H. Naeimi, Kh. Rabiei, M. Rezaei, **F. Meshkani**, Nanocrystalline magnesium oxide as a solid base catalyst promoted one pot synthesis of gem-dichloroaziridine derivatives under thermal conditions, *Iran Chem Soc* (2013) 10:161–167.
11. S. Rahmani, M. Rezaei, F. Meshkani, Preparation of Highly active nickel catalysts supported on mesoporous nanocrystalline  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> for CO<sub>2</sub> methanation, *Journal of Industrial and Engineering Chemistry*, 20 (2014) 1352-1346.
12. **F. Meshkani**, M. Rezaei, Iron based catalysts prepared via simple and direct pyrolysis method for high temperature water gas shift reaction, *Journal of Industrial and Engineering Chemistry*, 201 (2014) 3297-3302.
13. M. Khajenoori, M. Rezaei, **F. Meshkani**, Effect of CeO<sub>2</sub> promoter on the activity and coke formation of nickel catalyst supported on nanocrystalline MgO in dry reforming, *Chem. Eng. Technol.* 2014, 37, No. 6, 957–963.

14. F. Mirzaei, M. Rezaei, **F. Meshkani**, Syngas production via carbon dioxide reforming of methane over Co-MgO mixed oxide nanocatalysts, *Journal of Industrial and Engineering Chemistry*. 2014, In Press
15. S. Rahmani, M. Rezaei, **F. Meshkani**, Preparation of promoted nickel catalysts supported on mesoporous nanocrystalline gamma alumina for carbon dioxide methanation reaction, *Journal of Industrial and Engineering Chemistry* 20 (2014) 4176–4182.
16. Z. Alipour, M. Rezaei, **F. Meshkani**, Effect of alkaline earth promoters (MgO, CaO, and BaO) on the activity and coke formation of Ni catalysts supported on nanocrystalline Al<sub>2</sub>O<sub>3</sub> in dry reforming of methane, *Journal of Industrial and Engineering Chemistry* 20 (2014) 2858–2863
17. **F. Meshkani**, M. Rezaei, M. Andache, Investigation of the catalytic performance of Ni/MgO catalysts in partial oxidation, dry reforming and combined reforming of methane, *Journal of Industrial and Engineering Chemistry*, 20 (2014) 1251-1260.
18. Z. Alipour, M. Rezaei, **F. Meshkani**, Effect of Ni loadings on the activity and coke formation of MgO-modified Ni/Al<sub>2</sub>O<sub>3</sub> nanocatalyst in dry reforming of methane, *Journal of Energy Chemistry*, 23(2014) 633–638.
19. **F. Meshkani**, M. Rezaei, High Temperature Water Gas Shift Reaction over Promoted Iron Based Catalysts Prepared by Pyrolysis Method, *International Journal of Hydrogen Energy*, 39 (2014) 16318-16328.
20. Z. Alipour, M. Rezaei, **F. Meshkani**, Effects of support modifiers on the catalytic performance of Ni/Al<sub>2</sub>O<sub>3</sub> catalyst in CO<sub>2</sub> reforming of methane, *Fuel*, 129 (2014) 197-203.

21. **F. Meshkani**, M. Rezaei, Preparation of Nanocrystalline Metal (Cr, Al, Mn, Ce, Ni, Co and Cu) Modified Ferrite Catalysts for the High Temperature Water Gas Shift Reaction, *Renewable Energy* 74 (2015) 588-598
22. **F. Meshkani**, M. Rezaei, Preparation of mesoporous nanocrystalline iron based catalysts for high temperature water gas shift reaction: Effect of preparation factors, *Chemical Engineering Journal*, 260 (2015) 107–116.
23. **F. Meshkani**, M. Rezaei, Mesoporous Ba-promoted chromium free  $\text{Fe}_2\text{O}_3\text{-Al}_2\text{O}_3\text{-NiO}$  catalyst with low methanation activity for high temperature water gas shift reaction, *Catalysis Communications*, *Catalysis Communications* 58 (2015) 26–29.
24. **F. Meshkani**, M. Rezaei, A Highly Active and Stable Chromium Free Iron Based Catalyst for  $\text{H}_2$  Purification in High Temperature Water Gas Shift Reaction, *International J. of Hydrogen Energy*, 39 (2014) 18302-18311.
25. **F. Meshkani**, M. Rezaei, Preparation of Nanocrystalline  $\text{Fe}_2\text{O}_3\text{-Cr}_2\text{O}_3\text{-CuO}$  Powder by a Modified Urea Hydrolysis Method: A Highly Active and Stable Catalyst for High Temperature Water Gas Shift Reaction, *Materials Research Bulletin*, 64 (2015) 418-424.
26. **F. Meshkani**, M. Rezaei, The effect of preparation factors on the structural and catalytic properties of mesoporous nanocrystalline iron based catalysts for high temperature water gas shift reaction, *The Korean Journal of Chemical Engineering*, Accepted, 2014.
27. **F. Meshkani**, M. Rezaei, A facile method for preparation of iron based catalysts for high temperature water gas shift reaction, *Journal of Industrial and Engineering Chemistry* 20 (2014) 3297–3302.

28. **Fereshteh Meshkani**, Mehran Rezaei, Simplified direct pyrolysis method for preparation of nanocrystalline iron based catalysts for H<sub>2</sub> purification via high temperature water gas shift reaction, *Chemical Engineering Research and Design*, 95 (2015) 288-297.
29. **Fereshteh Meshkani**, Mehran Rezaei, Mohammad Jafarbagloo, Applying Taguchi robust design to the optimization of the synthesis parameters of nanocrystalline Cr-free Fe-Al-Cu catalyst for high temperature water gas shift reaction, *Materials Research Bulletin* 70 (2015) 229–235.
30. **Fereshteh Meshkani**, Mehran Rezaei, Preparation of 1 mesoporous nanocrystalline alkali promoted chromium free catalysts (Fe<sub>2</sub>O<sub>3</sub>-Al<sub>2</sub>O<sub>3</sub>-NiO) for a high temperature water gas shift reaction, *RSC Advances*, 5 (2015) 9995.
31. **Fereshteh Meshkani**, Mehran Rezaei, Preparation of mesoporous chromium promoted magnetite based catalysts for high temperature water gas shift reaction, *Industrial & Engineering Chemistry Research*, 54 (2015) 1236-1242.
32. **Fereshteh Meshkani**, Mehran Rezaei, Promoted Fe<sub>2</sub>O<sub>3</sub>-Al<sub>2</sub>O<sub>3</sub>-CuO Chromium Free Catalysts for High Temperature Water Gas Shift Reaction, *Chemical Engineering and Technology*, 2015, Accepted.
33. **Fereshteh Meshkani**, Mehran Rezaei, Comparison of Preparation Methods of Iron-Based Catalysts for High-Temperature Water-Gas Shift Reaction, *Chemical Engineering and Technology*, 2015, Accepted.

***Conference Proceedings:***

1- **Fereshteh Meshkani**, Mehran Rezaei, “Nanotechnology: Applications in Heterogeneous Catalysis”, 6th International Chemical Engineering Congress & Exhibition (2009)

2- **Fereshteh Meshkani**, Mehran Rezaei, “Synthesis of Nanostructured Magnesium Oxide with Polyvinyl alcohol and Sucrose as Surfactant and Chelating Agent”, 6th International Chemical Engineering Congress & Exhibition (2009)

3- **Fereshteh Meshkani**, Mehran Rezaei, “Synthesis of Nanocrystalline Magnesium Oxide with Plate-Like Shape”, 6th International Chemical Engineering Congress & Exhibition (2009)

4- Fereshteh Meshkani, Mehran Rezaei, “Stable Nickel Catalyst Supported on Nanocrystalline MgO in Methane Reforming with Carbon Dioxide” 13th Iranian National Chemical Engineering Congress & 1st International Regional Chemical and Petroleum Engineering (2010)

5- **F. Meshkani**, M.J. Parnian, M.Rezaei, “Preparation of NiO-MgO Catalysts for Dry Reforming Reaction” 13th Iranian National Chemical Engineering Congress & 1st International Regional Chemical and Petroleum Engineering (2010)

6- A biabani Ravandi , M. Rezaei, B. Nematollahi, **F. Meshkani**, “Effect of calcination temperature on structural properties of Iron-Cobalt nanocatalysts in low temperature CO oxidation” 7th International Chemical Engineering Congress & Exhibition, Kish, Iran (2011)

7- A biabani Ravandi , M. Rezaei, B. Nematollahi, **F. Meshkani**, Z. Fattah, “CO Oxidation over iron oxide nanocatalysts prepared via different methods and preparation” 7th International Chemical Engineering Congress & Exhibition (2011)



8- Z. Mosayebi , M. Rezaei, N hadian, **F. Meshkani**, “Synthesis of mesoporous  $MgAl_2O_4$  spinel nanopowder with high surface area” 7th International Chemical Engineering Congress & Exhibition, Kish, Iran (2011)

9- Z. Mosayebi, M. Rezaei, A. Biabani Ravandi, N hadian, **F. Meshkani**, “Autothermal reforming of methane over nickel catalysts supported on nanocrystalline  $MgAl_2O_4$  with high surface area” 7th International Chemical Engineering Congress & Exhibition, Kish, Iran (2011)

10- N hadian , M. Rezaei, Z. Mosayebi, **F. Meshkani**, “ $CO_2$  Reforming of Methane over Nickel Catalysts Supported on Nanocrystalline  $MgAl_2O_4$  with High Surface Area” 7th International Chemical Engineering Congress & Exhibition, Kish, Iran (2011)

11- Atiyeh Ranjbar , M. Rezaei, **F. Meshkani**, “Dry reforming reaction over nickel catalysts supported on calcium aluminates with different  $CaO/Al_2O_3$  ratio” 7th International Chemical Engineering Congress & Exhibition, Kish, Iran (2011)

12- Atiyeh Ranjbar , M. Rezaei, **F. Meshkani**, “Low temperature synthesis of nanocrystalline calcium aluminate compounds with surfactant-assisted precipitation method” 7th International Chemical Engineering Congress & Exhibition, Kish, Iran (2011)

13- A biabani Ravandi , M. Rezaei, B. Nematollahi, **F. Meshkani**, Z. Fattah, “Carbon Monoxide Oxidation over Iron – Cobalt Mixed Oxide Nanocatalysts” 8th International Chemical Engineering Congress & Exhibition, Kish, Iran (2011)

14- F. Meshkani, M.R. Mozdianfard, M.V. Maghrebi; " Nanotechnology; Positive and Negative Environmental Impact"; International Congress on Nanoscience & Nanotechnology (ICNN2012) 8–10, September 2012, Kashan, Iran

15- F. Mizaei, M. Rezaei, F. Meshkani, "Syngas production by carbon dioxide reforming of methane ”4 th International Conference on Ultrafine Grained and Nanostructured Mateials) UFGNSM2013), Tehran, Iran

16- S. Rahmni, M. Rezaei, F. Meshkani, "Ni/Al<sub>2</sub>O<sub>3</sub> nanocatalyst for CO<sub>2</sub> methanation ", 4 th International Conference on Ultrafine Grained and Nanostructured Mateials (UFGNSM2013), Tehran, Iran

17- **Fereshteh Meshkani**, Mehran Rezaei, Preparation of Iron Based Catalysts via Simple Pyrolysis Method for High Temperature Water Gas Shift Reaction, 8th International Chemical Engineering Congress & Exhibition, Kish, Iran (2014)

18- Masoud Khajenoori, Mehran Rezaei, **Fereshteh Meshkani**, Investigation of CeO<sub>2</sub> Promoter on The Activity and Coke Formation of Ni/MgO nano-catalyst in CO<sub>2</sub> Reforming of Methane, 8th International Chemical Engineering Congress & Exhibition, Kish, Iran (2014)

19- Fereshteh Meshkani, Mehran Rezaei, Preparation of nanostructured magnetite based catalyst for high temperature water gas shift reaction, 2nd International Conference on Nanotechnology (ICN 2014), 10-12 April 2014, Istanbul University, Oral presentation

20- F. Meshkani, M. Rezaei, M. Jafarbegloo, Effect of Iron Precursor on the Preparation of Mesoporous Nanocrystalline Chromium Free Fe<sub>2</sub>O<sub>3</sub>-Al<sub>2</sub>O<sub>3</sub>-NiO Catalyst for High Temperature Water Gas Shift Reaction, 2nd International Conference Of Oil, Gas And Petrochemical, December 18, 2014, Tehran, Iran

21- **Fereshteh Meshkani**, Mehran Rezaei, Preparation of mesoporous nanocrystalline chromium free Fe<sub>2</sub>O<sub>3</sub>-Al<sub>2</sub>O<sub>3</sub>-NiO catalyst for high temperature water gas shift reaction: Effect of precipitant agent, 5th International Congress on Nanoscience & Nanotechnology (ICNN2014), 22-24 October 2014, Tehran, Iran

۲۲- خواجه نوری، رضایی، مشکانی، بررسی فعالیت و تشکیل کربن کاتالیست Ni/MgO ارتقایافته با اکسید سریم در فرآیند ریفرمینگ خشک متان، اولین همایش ملی کاتالیستهای صنعتی، ۱۳۹۱، شیراز

۲۳- علیپور، رضایی، مشکانی، تاثیر ارتقا دهنده اکسید کلسیم بر فعالیت کاتالیستی و تشکیل کربن کاتالیست نیکل در فرآیند ریفرمینگ خشک متان، اولین همایش ملی کاتالیستهای صنعتی، ۱۳۹۱، شیراز

## Patents

✚ مهران رضایی، فرشته مشکانی: ساخت کاتالیست های تک فلزی و دو فلزی بر پایه اکسیدهای نانوکریستالی جهت تولید گاز سنتز

✚ مهران رضایی، فرشته مشکانی: تهیه اکسید منیزیم با ساختار نانوکریستالی و با مساحت سطح ویژه بالا با استفاده از روش رسوب گیری و با افزودن ماده فعال سطحی غیر یونی پلی وینیل الکل

✚ مهران رضایی، ابوالفضل بیابانی، فرشته مشکانی: سیستم اندازه گیری مساحت سطحی و آنالیزهای برنامه ریزی شده دمایی