Recent Advances in Plasma Catalysis (ISPCEM 2016)

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The series of International Symposium on Plasma for Catalyses and Energy Materials (ISPCEM) found its origin in 2012 and take place biannually in Tianjin, China [1, 2]. The aim of the symposia is to provide a platform for scientists and students who are working on the combination of plasma technology and catalyst or nano energy material to exchange ideas, to discuss future development and to promote collaboration. 93 participants from 12 countries attended ISPCEM-2016 attracted, reflecting its international collaboration nature.

On the basis of the results presented at ISPCEM-2016, this themed *Topics in Catalysis* issue entitled “Recent Advances in Plasma Catalysis (ISPCEM 2016)” is organized and published. The contents of the present issue comprise three reviews and 19 original papers. The reviews overviewed recent advances in the following areas: (1) plasmas in contact with liquids for chemical processing and material synthesis [3]; (2) non-colloidal nanocatalysts

fabricated using arc plasma deposition for heterogeneous catalysis and photocatalysis [4]; (3) carbon surface modifications by plasma for catalyst support and electrode materials [5]. The original papers cover different areas of plasma application for catalyses and energy materials, which can be categorized by topics as: (1) reforming of methane [6–9]; (2) conversion of CO [10–14]; (3) environmental processes [15–21]; (4) hydrogenation and hydrochlorination reactions [22–24]. This themed issue provides a picture of recent advances in plasma catalysis, which should be of significant interest in both academic and industrial scientists of all disciplines using plasma technology and/or catalysts. We hope that this themed issue would give new directions and trigger further progress and collaboration in the related fields.

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References

1. Jang BW-L, Liu C-J, Endres F, Nozaki T (2013) Recent advances in plasma and catalysis (ISPCEM 2012). *Catal Today* 211:1
2. Nozaki T, Neyts EC, Ostrikov K, Liu C-J (2015) Plasmas for enhanced catalytic processes (ISPCEM 2014). *Catal Today* 256:1–2

3. Rumbach P, Go DB (2017) Perspectives on plasmas in contact with liquids for chemical processing and materials synthesis. *Top Catal* 60:1. doi:[10.1007/s11244-017-0745-9](https://doi.org/10.1007/s11244-017-0745-9) (this issue)
4. Kim SH, Moon S-Y, Park JY (2017) Non-colloidal nanocatalysts fabricated using arc plasma deposition and their application in heterogenous catalysis and photocatalysis. *Top Catal* 60:2. doi:[10.1007/s11244-017-0746-8](https://doi.org/10.1007/s11244-017-0746-8) (this issue)
5. Zhang L, Sadanandam G, Liu X, Scurrrell MS (2017) Carbon surface modifications by plasma for catalyst support and electrode materials applications. *Top Catal* 60:3. doi:[10.1007/s11244-017-0747-7](https://doi.org/10.1007/s11244-017-0747-7) (this issue)
6. Lian J, Fang X, Liu W, Huang Q, Sun Q, Wang H, Wang X, Zhou W (2017) Ni supported on LaFeO₃ perovskites for methane steam reforming: on the promotional effects of plasma treatment in H₂-Ar atmosphere. *Top Catal* 60:4. doi:[10.1007/s11244-017-0748-6](https://doi.org/10.1007/s11244-017-0748-6) (this issue)
7. Rahem N, Haghighi M, Babaluo AA, Allahyari S, Estifae F, Jafari MF (2017) Plasma-assisted dispersion of bimetallic Ni-Co over Al₂O₃-ZrO₂ for CO₂ reforming of methane: influence of voltage on catalytic properties. *Top Catal* 60:5. doi:[10.1007/s11244-017-0749-5](https://doi.org/10.1007/s11244-017-0749-5) (this issue)
8. Lu N, Bao X, Jiang N, Shang K, Li J, Wu Y (2017) Non-thermal plasma-assisted catalytic dry reforming of methane and carbon dioxide over G-C₃N₄-based catalyst. *Top Catal* 60:6. doi:[10.1007/s11244-017-0750-z](https://doi.org/10.1007/s11244-017-0750-z) (this issue)
9. Ray D, Reddy PMK, Challapalli S (2017) Glass beads packed DBD-plasma assisted dry reforming of methane. *Top Catal* 60:7. doi:[10.1007/s11244-017-0751-y](https://doi.org/10.1007/s11244-017-0751-y) (this issue)
10. Zhao B, Chen Z, Yan X, Ma X, Hao Q (2017) CO methanation over Ni/SiO₂ catalyst prepared by ammonia impregnation and plasma decomposition. *Top Catal* 60:8. doi:[10.1007/s11244-017-0752-x](https://doi.org/10.1007/s11244-017-0752-x) (this issue)
11. Yan X, Bao J, Zhao B, Yuan C, Hu T, Huang C, Li Y (2017) CO dissociation on Ni/SiO₂: the formation of different carbon materials. *Top Catal* 60:9. doi:[10.1007/s11244-017-0754-8](https://doi.org/10.1007/s11244-017-0754-8) (this issue)
12. Kardash TY, Slavinskaya EM, Gulyaev RV, Zaikovskii AV, Novopashin SA, Boronin AI (2017) Enhanced thermal stability of Pd/Ce-Sn-O catalysts for CO oxidation prepared by plasma-arc synthesis. *Top Catal* 60:10. doi:[10.1007/s11244-017-0755-7](https://doi.org/10.1007/s11244-017-0755-7) (this issue)
13. Zhu B, Liu J-L, Li X-S, Liu J-B, Zhu X, Zhu A-M (2017) In-situ regeneration of Au nanocatalysts by atmospheric-pressure air plasma: regeneration characteristics of square-wave pulsed plasma. *Top Catal* 60:11. doi:[10.1007/s11244-017-0756-6](https://doi.org/10.1007/s11244-017-0756-6) (this issue)
14. Di LB, Duan DZ, Park D-W, Ahn W-S, Lee B-J, Zhang XL (2017) Cold plasma for synthesizing high performance bimetallic PdCu catalysts: effect of reduction sequence and Pd/Cu atomic ratios. *Top Catal* 60:12. doi:[10.1007/s11244-017-0757-5](https://doi.org/10.1007/s11244-017-0757-5) (this issue)
15. Gholipour A, Rahemi N, Allahyari S, Ghareshabani E (2017) Hybrid plasma-catalytic oxidation of VOCs with NiMn/montmorillonite: plasma and catalyst considerations. *Top Catal* 60:13. doi:[10.1007/s11244-017-0758-4](https://doi.org/10.1007/s11244-017-0758-4) (this issue)
16. Sudhakaran MSP, Trinh HQ, Karuppiah J, Hossian MM, Mok YS (2017) Plasma catalytic removal of p-xylene from air stream using γ -Al₂O₃ supported manganese catalyst. *Top Catal* 60:14. doi:[10.1007/s11244-017-0759-3](https://doi.org/10.1007/s11244-017-0759-3) (this issue)
17. Misumi S, Yoshida H, Matsumoto A, Hinokuma S, Sato T, Machida M (2017) Thermal evolution of the structure and activity of Rh overlayer catalysts prepared by pulsed arc-plasma deposition. *Top Catal* 60:15. doi:[10.1007/s11244-017-0760-x](https://doi.org/10.1007/s11244-017-0760-x) (this issue)
18. Tatchemo FWB, Nzali S, Youbi GK, Djowe AT, Saa DK, Acayanka E, Laminsi S, Gaigneaux EM (2017) Gliding arc plasma synthesis of MnO₂ nanorods for the plasma-catalytic bleaching of azoic Amaranth Red dye. *Top Catal* 60:16. doi:[10.1007/s11244-017-0761-9](https://doi.org/10.1007/s11244-017-0761-9) (this issue)
19. Shang K, Wang X, Li J, Wang H, Jiang N, Lu N, Wu Y (2017) Effect of persulfate on the degradation of Acid Orange 7 (AO7) by dielectric barrier discharge plasma. *Top Catal* 60:17. doi:[10.1007/s11244-017-0762-8](https://doi.org/10.1007/s11244-017-0762-8) (this issue)
20. Zhang X, Li Z, Zhan Z, Di L (2017) Preparation of F-doped TiO₂ photocatalysts by gas-liquid plasma at atmospheric pressure. *Top Catal* 60:1. doi:[10.1007/s11244-017-0763-7](https://doi.org/10.1007/s11244-017-0763-7) (this issue)
21. Wang W, Li X, Wang A, Sun Z, Chen Y (2017) Plasma synthesis of Ni₂P from mixtures of NiCl₂ and hypophosphites. *Top Catal* 60:19. doi:[10.1007/s11244-017-0764-6](https://doi.org/10.1007/s11244-017-0764-6) (this issue)
22. Li Y, Jang BW-L (2017) Selective hydrogenation of acetylene over Pd/Al₂O₃ catalysts: effect of non-thermal RF plasma preparation methodologies. *Top Catal* 60:20. doi:[10.1007/s11244-017-0765-5](https://doi.org/10.1007/s11244-017-0765-5) (this issue)
23. Guo Z, Huang Q, Luo S, Chu W (2017) Atmospheric discharge plasma enhanced preparation of Pd/TiO₂ catalysts for acetylene selective hydrogenation. *Top Catal* 60:21. doi:[10.1007/s11244-017-0766-4](https://doi.org/10.1007/s11244-017-0766-4) (this issue)
24. Dai H, Zhu M, Zhao D, Yu F, Dai B (2017) Effective catalytic performance of plasma-enhanced W₂N/AC as catalysts for acetylene hydrochlorination. *Top Catal* 60:22. doi:[10.1007/s11244-017-0767-3](https://doi.org/10.1007/s11244-017-0767-3) (this issue)