ساخت و شناسایی نانو لوله‌های وانادیوم اکسید

احسان کیانفر*+، بهنام کوهستانی

اراک، دانشگاه آزاد اسلامی واحد اراک، گروه مهندسی شیمی

چکیده:

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مقدمه

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مراجع

[1] Iijima S., Helical Microtubules of Graphitic Crbon, *Nature*, **354**(6348):56–58 (1991).

[2] Lam E., Luong J.H.T., Carbon Materials as Catalyst Supports and Catalysts in th Transformation of Biomass to Fuels and Chemicals, *ACS Catalysis*, **4**(10): 3393-3410 (2014).

[3] Haffer S., Lüder C., Walther T., Köferstein R., Ebbinghaus S.G., Tiemann M.., A Synthesis Concept for a Nanostructured $CoFe_2O_4/BaTiO_3$ Composite: Towards Multiferroics, Microporous and Mesoporous Materials, **196**(2014): 300-304 (2014).

[4] Habibi M.H., Mardani M., Co-Precipitation Synthesis of Nano-Composites Consists of Zinc and Tin Oxides Coatings on Glass with Enhanced Photocatalytic Activity on Degradation Reactive Blue 160 KE2B, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, **137**(0): 785-789 (2015).

[5] Jana N.R., Gearheart L., Murphy C.J., Wet Chemical Synthesisof Silver Nanorods and Nanowires of Controllable Aspect Ratio, *Chem Commun*, 2001(7):617–618 (2001).

[6] Tremel W., Inorganic Nanotubes, *Chem. Int. Ed.*, **38**: 2175-2179 ((1999))

[7] Shenton W., Douglas T., Young M., Stubbs G., Mann S., *Adv. Mater.*, Inorganic-Organic Nanotube Composites from Template Mineralization, **11**: 253-256 (1999).

[8] Chandrappa G.T., Steunou N., Cassaignon S., Bauvais C., Biswas P.K., Livage J., Vanadium Oxide: from Gels Tonanotubes, *J. Sol. Gel. Sci. Technol.*, **26**(1): 593-596 (2003).

[9] Solsona B., Blasco T., López Nieto J.M., Peña M.L., Rey F., Vidal-Moya A., Vanadium Oxide Supported on MesoporousMCM-41 as Selective Catalysts in the Oxidative Dehydrogenationof Alkanes, *J. Catal.*, **203**(2):443-452 (2001).

[10] Muhr H.J., Krumeich F., Sch¨onholzer U.P., Bieri F., Niederberger M.,Gaukler L.J., Nesper R., Vanadium Oxide Nanotubes—A New Flexible Vanadate Nanophase., *Adv. Mater.*, **12**:231-234 (2000).

[11] Zhang K.F., Guo D.J., Liu X., Li J., Li H.L., Su Z.X., Vanadium Oxide Nanotubes as the Support of Pd Catalysts for Methanol Oxidation in Alkaline Solution, *J. Power.Sources.*, **162**:1077- 1081 (2006).

[12] Spahr M.E., Stoschitzki-Bitterli P., Nesper R., Haas O., Nov0ak P., Vanadium Oxide Nanotubes. A New Nanostructured Redox-Active Material for the Electrochemical Insertion of Lithium., *J. Electrochem. Soc.*, **146**: 2780-2783 (1999).

[13] Krumeich F., Muhr H.J., Niederberger M., Bieri F., Schnyder B., Nesper R., Morphology and Topochemical Rections of Novel Vanadium Oxide, *J. Am. Chem. Soc.*, **121**:8324- 8331 (1999).

[14] Ledoux M.J., High-Yield Butane to Maleic Anhydridedirect Oxidation on Vanadyl Pyrophosphate Supported on Heatconductivematerials: b-SiC, Si3N4, and BN., *J. Catal.* **203**(2): 495–508 (2001).

[15] Yin H., Yu K., Zhang Z., Zeng M., Lou L., Zhu Z., Humidity Sensing Properties of Flower-Like VO2(B) and VO2(M) Nanostructures, *Electroanalysis*, **23**: 1752-1758 (2011).

[16] Ajayan P.M., Stephan O., Redlich P., Colliex C., *Nature*, Carbon Nanotubes as Removable Templates for Metal-Oxide Nanocomposites and Nanostructures, **375**:564- 567 (1995).

[17] Bieri F., Krumeich F., Muh H.J., Nesper R., *Helv*. the Discovery of VOx Nanotubes, *Chain*. *Acta*., **84**:3015-3020 (2001).

[18] Grigorieva A.V., Goodilin E.A., Anikina A.V., Kolesnik I.V., Tretyakov Y.D., Polycrystalline Vanadium Oxide Nanorods: Growth, Structure and Improved Electrochemical Response as a Li-Ion Battery Cathode Material., *Mendeleev Commun*, **18**:71-72 (2008).

[19] Sediri F., Touati F., Gharbi N., Sensor Pproperties of Vanadium Oxide Nanotubes., *Mater. Lett*., **61**:1947-1950 (2007).

[20] Aghabozorg H.R., Mousavi R., Asckari S., Aghabozorg H., Effects of Synthesis Methods of Vanadium Oxide Nanotubes on the Inter Layer Distances, *J. Nanopart*, **9**: 497-500 (2007).

[21] Chen W., Peng J., Mai L., Zhu Q., Xu Q., Micromorphology and Structure of Vanadium Oxide Nnanotubes, *Mater Lett*., **58**: 2275-2278 (2004).

[22] Bouhedja L., Stenou N., Maquet J., Livage J., Sol-Gel Preparation and Characterization of Non-substituted and Sr-substituted Lanthanum Cobaltates, *J. Solid. State. Chem*., **162**:315-318 (2001).

[23] Zhu YP[1], Wang XK, Guo WL, Wang JG, Wang C., Sonochemical Synthesis of Silver Nanorodsby Reduction of Sliver Nitrate in Aqueous Solution, *Ultrason Sonochem*, **7**(4):675–679 (2010).

[24] Neppolian B., Wang Q., Jung H., Choi H., Ultrasonic-Assisted Sol-Gel Method of Preparation of TiO_2 Nano-Particles: Characterization, Properties and 4-Chlorophenol Removal Application, *Ultrason. Sonochem.*, **15**(4):649-658 (2008).

[25] Mai L., Chen W., Qing Xu., Zhu Q., Han C., Peng J., Cost-saving Synthesis of Vanadium Oxide Nanotubes, *Solid. State. Commun*., **126**: 541-543 (2003).

[26] Chen X., Sun X., Li Y., Self-Assembling Vanadium Oxide Nanotubes by Organic Molecular Templates., *Inorg. Chem.*, **41**:4524-4530 (2002).

[27] Reinoso J.M., Muhr H.J., Krumich F., Bieri F., Nesper R., Colloid Chemistry I - Page 169 - Google Books Result., *Helv.Chim. Acta*., **83**: 1724-1729 (2000)

[28] Awati P.S., Awate S.V., Shah P.P., Ramaswamy V., Photocured Materials: - Page 133 - Google Books Result., *Catal. Commun*., **4**: 393-400 (2003).

[29] Niederberger M., Vanadium Oxide (2004).