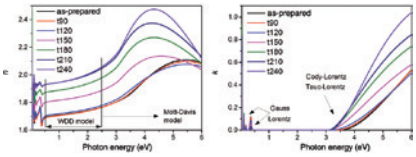
In this issue

Petr Janicek, Stanislav Slang, Karel Palka and Miroslav Vlcek

Spectroscopic ellipsometry characterization of spin-coated $Ge_{25}S_{75}$ chalcogenide thin films

DOI 10.1515/pac-2016-1019
Pure Appl. Chem. 2017; 89(4): 437–449

Conference paper: Determined $Ge_{25}S_{75}$ refractive index n (left column), and extinction coefficient k (right column), as a function of photon energy in the wide spectral range. Indication of spectral ranges where different models [Mott-Davis, Wemple-DiDomenico (WDD)] are used (left), indicate the different oscillators used (right).



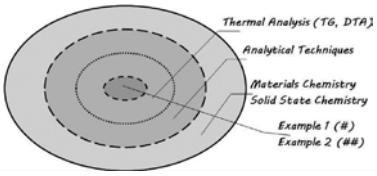
Keywords: amorphous chalcogenides; optical properties; spectroscopic ellipsometry; spin-coating; SSC-2016.

Milan Drábik

The challenge of methods of thermal analysis in solid state and materials chemistry

DOI 10.1515/pac-2016-1105
Pure Appl. Chem. 2017; 89(4): 451–459

Conference paper: #, DTA of Fe-doped clinoptilolite: decreased T_{max} value (by 100 °C) of structurally typical DTA effect of FeOOH, the incorporation of doping component into zeolite. ##, TG and DTA of macrodefectfree (MDF) materials: localisation of temperature range of the decomposition of P-O-Al/Fe cross-links in the interval 200–300 °C, enhanced analytical use in a variety of both raw mixtures and final MDF materials.



Keywords: differential thermal analysis; iron doped clinoptilolite; macrodefectfree materials; thermogravimetry.

Károly Lázár

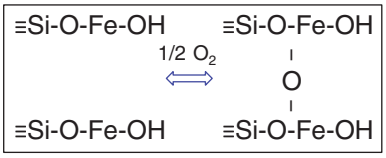
Redistribution of iron ions in porous ferrisilicates during redox treatments

DOI 10.1515/pac-2016-1026
Pure Appl. Chem. 2017; 89(4): 471–479

Conference paper: Highlights: (i) dinuclear μ-oxo $Fe^{3+}_{framework}$-O-$Fe^{2+}_{extra\text{-}framwork}$ centers may form by redistribution of iron in microporous FER and MFI ferrisilicates; (ii) reversible redox $Fe^{2+} \Leftrightarrow Fe^{3+}$ changes are facile on the extra-framework part of these dinuclear centers; (iii) local environment of iron may profoundly altered in mesoporous MCM-41; (iv) All the mentioned features can be correlated with catalytic performance in oxygen transfer.

Keywords: dinuclear μ-oxo iron; framework and extra-framework iron; in situ Mössbauer spectroscopy; μ-oxo iron dimers; porous ferrisilicates; SSC-2016.

Example for formation of dinuclear centre



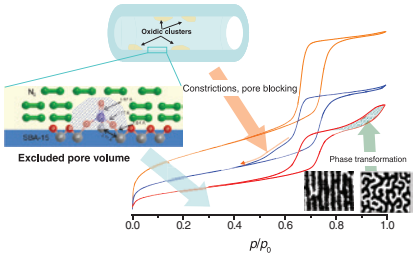
Roman Bulánek and Pavel Čičmanec

Textural and morphology changes of mesoporous SBA-15 silica due to introduction of guest phase

DOI 10.1515/pac-2016-1017
Pure Appl. Chem. 2017; 89(4): 481–491

Conference paper: Alteration of surface area and pore volume upon introduction of guest phase into mesoporous silica is, in some cases, apparent due to dilution of silica by anchored complexes and by exclusion of a certain volume from pore voids available for adsorption and capillary condensation.

Keywords: adsorption; SBA-15; SSC-2016; surface area; texture; vanadium.



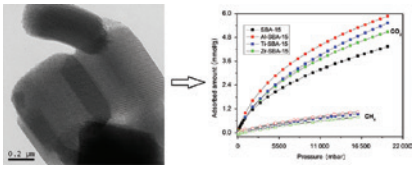
Vladimír Zeleňák, Jozef Magura, Adriána Zeleňáková and Romana Smolková

Carbon dioxide and methane adsorption over metal modified mesoporous SBA-15 silica

DOI 10.1515/pac-2016-1121
Pure Appl. Chem. 2017; 89(4): 493–500

Conference paper: Metal ion doped (Al^{3+}, Ti^{4+}, Zr^{4+}) silica nanoporous materials were synthesized and characterized. Samples were evaluated in terms of adsorption of carbon dioxide and methane at 303 K.

Keywords: carbon dioxide; mesoporous silica; metal doping; methane; SBA-15.



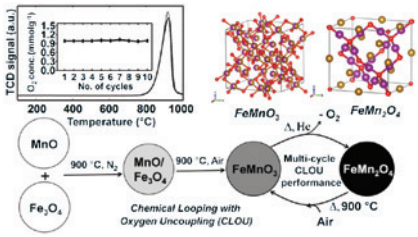
Pallavi B. Mungse, Govindachetty Saravanan, Maiko Nishibori, Jan Subrt and Nitin K. Labhsetwar

Solvent-free, improved synthesis of pure bixbyite phase of iron and manganese mixed oxides as low-cost, potential oxygen carrier for chemical looping with oxygen uncoupling

DOI 10.1515/pac-2016-1127
Pure Appl. Chem. 2017; 89(4): 511–521

Conference paper: Bixbyite phase of Fe-Mn mixed oxide i.e. $FeMnO_3$ showed enhanced multi-cycle, chemical looping with oxygen uncoupling performance for carbon dioxide capture and sequestration applications.

Keywords: CO_2 capture and sequestration; lattice; mixed metal oxides; reactive oxygen; SSC-2016; thermal power plants.



Elena Asabina, Vladimir Pet'kov, Pavel Mayorov, Dmitriy Lavrenov, Igor Schelokov and Andrey Kovalsky

Synthesis, structure and thermal expansion of the phosphates $M_{0.5+x}M'_xZr_{2-x}(PO_4)_3$ (M, M′–metals in oxidation state +2)

DOI 10.1515/pac-2016-1005
Pure Appl. Chem. 2017; 89(4): 523–533

Conference paper: The possibility of incorporation of metals in oxidation state +2 into the framework and cavities sites of $M_{0.5+x}M'_xZr_{2-x}(PO_4)_3$ (M–Ca, Mn, Co, Sr, Cd, Ba, Pb; M′–Mg, Mn, Co; $0 \le x \le 2.0$) phosphates was experimentally investigated. The obtained solid solutions limits may be useful in crystal chemical design of materials with smoothly changing properties, in particular, controllable thermal expansion coefficients.

Keywords: metal in oxidation state +2; phosphate; SSC-2016; structure; synthesis; thermal expansion; zirconium.