VOLUME 2a

CHEMISTRY AND TECHNOLOGY OF MATERIALS AND NANOMATERIALS

ABSTRACT BOOK
in 5 volumes

26–30 September
EKATERINBURG • 2016
XX Mendeleev Congress on general and applied chemistry.

ISBN 978-5-7691-2451-8
Vol. 2a. Chemistry and technology of materials and nanomaterials

Volume 2a includes abstracts of plenary lectures of Congress, keynote lectures, invited reports, oral and poster presentations of the section: «Chemistry and technology of materials and nanomaterials». 
The XX Mendeleev Congress is held under the auspices of the International Union of Pure and Applied Chemistry (IUPAC)

ORGANIZERS OF THE CONGRESS

The Russian Academy of Sciences
Ural Branch of the Russian Academy of Sciences
The Ministry of Education and Science of the Russian Federation
B. N. Yeltsin Ural Federal University
Federal Agency for Scientific Organizations
A.N. Frumkin Institute of Physical Chemistry and Electrochemistry of RAS
I. Ya. Postovsky Institute of Organic Synthesis, Ural branch of RAS
Sverdlovsk Region Administration
The Russian Foundation for Basic Research
D.I. Mendeleev Russian Chemical Society
The National Committee of Russian Chemists
Russian Chemists Union

The General partner
Art, Science and Sport Charity Foundation
CONTENT

Plenary lectures .............................................................................................................. 9

Section 2
«Chemistry and technology of materials and nanomaterials»: ........ 31

- Keynote lectures .......................................................................................................... 31
- Invited reports .............................................................................................................. 39
- Oral presentations ........................................................................................................ 49
- Poster presentations ................................................................................................... 137

Author index .................................................................................................................... 423
Partners and sponsors ..................................................................................................... 441
PROPERTIES OF SUSPENSIONS FOR STEREOLITHOGRAPHY BASED ON COLORED CALCIUM PHOSPHATES

Kurbatova S.A., Safronova T.V., Evdokimov P.V., Putlyaev V.I., Karpushkin E.A.

Lomonosov Moscow State University, Leninskie Gory, 1-3, Moscow, 119991, Russia, e-mail: kurbatova.snezhana@yandex.ru

Modern regenerative medicine requires the creation of new materials for bone implantation, in which the most important properties are biocompatibility, resorbability and osteoconductivity. Calcium phosphates with a ratio of Ca / P < 1.67 are biocompatible, their ability to resorption increases with a decrease of this ratio, that's why calcium phosphates with a ratio of 0.5 ≤ Ca / P ≤ 1 are very perspective to be studied. Getting good osteoconductive properties (high penetration, porosity) is possible with the use of rapid prototyping techniques (stereolithography).

Suspension based on light-curing monomers and calcium phosphate powders is used for stereolithographic printing. To increase the printing resolution colourants are added, however, calcium phosphates obtained by heat treatment (T < 900 °C) from amorphous calcium phosphate synthesized from solutions of phosphoric acid and calcium acetate, themselves have a gray color due to the presence of carbon adsorbed on the particle surface.

To evaluate the properties of the suspensions based on calcium phosphate powders calcium pyrophosphate Ca₃P₂O₇ was selected (CPP). In a result of our research activity we developed synthesis method of hydrated calcium phosphates using ion exchange; we obtained stable and homogeneous suspensions based on coloured CPP powders to create macroporous ceramic materials with a predetermined architecture by the stereolithography; we explored the properties of the suspensions (viscosity, photosensitivity, critical polymerization energy). It was showed that the variation of the photosensitivity of suspensions by changing of the colour of the CPP powder improves the resolution of stereolithography.

This work was supported by RSF, grant 15-19-00103.