Critical V2O5/TeO2 ratio inducing abrupt property changes in vanadium tellurite glasses -
DTU Orbit (11/10/2018)

Critical V2O5/TeO2 ratio inducing abrupt property changes in vanadium tellurite glasses
Transition metal containing glasses have unique electrical properties and are therefore often used for electrochemical
applications, such as in batteries. Among oxide glasses, vanadium tellurite glasses exhibit the highest electronic
conductivity and thus the high potential for applications. In this work, we investigate how the dynamic and physical
properties vary with composition in the vanadium tellurite system. The results show that there exists a critical V2O5
concentration of 45 mol %, above which the local structure is subjected to a drastic change with increasing V2O5, leading
to abrupt changes in both hardness and liquid fragility. Electronic conductivity does not follow the expected correlation to
the valence state of the vanadium as predicted by the Mott-Austin equation but shows a linear correlation to the mean
distance between vanadium ions. These findings could contribute to designing optimum vanadium tellurite compositions
for electrochemical devices. The work gives insight into the mechanism of electron conduction in the vanadium tellurite
systems. (Graph Presented).

General information
State: Published
Organisations: Department of Chemistry, Centre for Catalysis and Sustainable Chemistry, Aalborg University, Federal
University of São Carlos
Contributors: Kjeldsen, J., Rodrigues, A. C. M., Mossin, S., Yue, Y.
Number of pages: 7
Pages: 14942-14948
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Journal of Physical Chemistry B
Volume: 118
Issue number: 51
ISSN (Print): 1520-6106
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 3.13 SJR 1.331 SNIP 1.015
Web of Science (2017): Impact factor 3.146
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 3.03 SJR 1.345 SNIP 1.012
Web of Science (2016): Impact factor 3.177
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 3.25 SJR 1.335 SNIP 1.076
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 3.28 SJR 1.449 SNIP 1.138
Web of Science (2014): Impact factor 3.302
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 3.53 SJR 1.504 SNIP 1.202
Web of Science (2013): Impact factor 3.377
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 3.66 SJR 1.943 SNIP 1.256
Web of Science (2012): Impact factor 3.607
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes