5GH Foundation

Abnormal Citation Patterns on 10.1016/j.ijhydene.2013.05.060

Abnormal citation patterns are observed on the article [1]. The article cites a total number of 29 references, 15 (52%) of them were co-authored by ZHU Bin. Although those reference with ZHU Bin may be relevant to the article [1], but such a high proportion is questionable, and it is intended to artificially inflate ZHU's citation metrics. Notably, Rizwan Raza, one of the authors of article [1], has maintained a long-standing collaborative relationship with ZHU.

4. Conclusions

The one-step co-precipitation technique has a number of scientific advantages, such as simple preparation modus operandi for enhanced quality control; better homogeneity at the nanoscale; improve and enhance the ionic conductive properties of ceria–carbonate electrolyte and cause superionic conduction at low temperatures. The as-prepared electrolytes exhibited a glass transition 300 °C. The XRD indexing emphasizes that all electrolytes execute cubic fluorite structure. Since the as prepared ceria based nanocomposite electrolytes are two-phase materials. The first phase is cubic crystallite phase and second phase of alkali elements (Li, Na, K) were found to be amorphous. The Arrhenius plot was obtained using linear fitting technique from the electrochemical impedance spectroscopy data. The LNK-SDC nanocomposite electrolyte exhibits 0.098 Scm^{-1} ionic conductivity in air atmosphere, which is greater than that of others LN-SDC and NK-SDC electrolytes. The low activation energies of the nanocomposite electrolytes (LNK-SDC, LN-SDC, NK-SDC) in the air atmosphere were found to be 0.59 eV, 0.48 eV and 0.32 eV respectively, which indicates the fast chemical reaction occurs after supplying the fuel. Power peak densities of 286 mW/cm^2, 337 mW/cm^2, and 484 mW/cm^2 were achieved at 570 °C for a single cell based electrolyte (NK-SDC, LN-SDC and LNK-SDC). It has been found that the contribution of ternary carbonated electrolyte LNK-SDC is a good electrolyte that has acquired the high power density of 484 mW/cm^2 at 570 °C than that of YSZ electrolyte at 1000 C this all has been achieved by applying the NANOCOFC approach and it may also be concluded that the NANOCOFC approach provides a potential electrolyte material for LTSOFCs.

Acknowledgments

Higher Education Commission, Pakistan (HEC) is highly acknowledged for financially support under International Research Support Initiative Program (ISRIP) to complete this work and the Department of Energy Technology, Royal Institute of Technology, KTH, Sweden is also acknowledged to provide all facilitations to achieve the results for the completion of work.

REFERENCES

[1] Kreuer KD. Proton conducting oxides. Annu Rev Mater Res 2003;33:333–59.
[2] Vielstich W, Lamm A, Gasteiger HA. In: Handbook of fuel cells fundamentals, technology and applications, vol. 4. New Jersey, USA: John Wiley & Sons; 2003. p. 987–1001.
[3] Steele BCH. Materials for IT-SOFC stacks 35 years R&D: the inevitability of gradualness? Solid State Ionics 2000;134:3–20.
[4] Steele BCH. Appraisal of $Ce_{1-y}Gd_yO_{2-y/2}$ electrolytes for IT-SOFC operation at 500 °C. Solid State Ionics 2000;129:95–110.
[5] Mogensen M, Sammes NM, Tompsett GA. Physical, chemical and electrochemical properties of pure and doped ceria. State Ionics 2001;139(3):267–80.
[6] Li LC. Electrolytic domain boundary between ionic and electronic conduction of doped ceria. J Mater Sci Technol 1998;451(14).
[7] Badwal SPS, Ciacchi FT, Drennan J. Investigation of the stability of ceria–gadolinium electrolytes in solid oxide fuel cell environments. Solid State Ionics 1999;121(253).
[8] Tschope A. Solid grain size-dependent electrical conductivity of polycrystalline cerium oxide II: space charge model. State Ionics 2001;139(3):267–80.
[9] Zhu W, Xia C, Dong D, Shi X, Meng G. Electrical properties of ceria–carbonate composite electrolytes. Mater Res Bull 2006;41:2057–64.
[10] Liu XR, Zhu B, Xu J, Sun JC, Mao ZQ. Sulphate-ceria composite ceramics for energy environmental co-generation technology. Key Eng Mater 2005;280(283):425–30.
[11] Zhu B, Albinsson I, Andersson C, Borsand K, Nilsson M, Mellander BE. Electrolysis studies based on ceria-based composites. Electrochem Commun 2006;8:495–8.
[12] Xu S, Niu X, Chen M, Wang C, Zhu B. Carbon doped MO–SDC material as an SOFC anode. J Power Sources 2007;165:82–6.
[13] Huang J, Yang L, Gao R, Mao Z, Wang C. A high-performance ceramic fuel cell with samarium doped ceria–carbonate composite electrolyte at low temperatures. Electrochem Commun 2006;8:785–9.
[14] Li S, Wang X, Zhu B. Novel ceramic fuel cell using non-ceria-based composites as electrolyte. Electrochem Commun 2007;9:2863–6.
[15] Zhu B, Li S, Mellander BE. Theoretical approach on ceria-based two-phase electrolytes for low temperature (300–600 C) solid oxide fuel cells. Electrochem Commun 2008;10:302–5.
[16] Zhu B. Advantages of intermediate temperature solid oxide fuel cells for tractionary applications. J Power Sources 2001;93:82–6.
[17] Zhu B, Yang XT, Xu J, Zhu ZG, Ji SJ, Sun MT, et al. Innovative low temperature SOFCs and advanced materials. J Power Sources 2003;118:47–53.
[18] Huang J, Mao Z, Liu Z, Wang C. Development of novel low-temperature SOFCs with co-ionic conducting SDC-carbonate composite electrolytes. Electrochem Commun 2007;9:2601–5.
[19] Raza R, Wang X, Ma Y, Liu X, Zhu B. Improved ceria–carbonate composite electrolytes. Int J Hydrogen Energy 2010;35:2684–8.
[20] Zhu B. In: Introduction on NANOCOFC science and workshop, in an International conference on hydrogen energy, August, Changsha, China 2008. p. 3–6.
[21] Tanga Z, Lin Q, Mellander BE, Zhu B. SDC–LiNa carbonate composite and nanocomposite electrolytes. Int J Hydrogen Energy 2010;35:2970–5.
[22] Wang X, Ying M, Li S, Zhu B, Muhammed M. SDC/Na_2CO_3nanocomposite: new freeze drying based synthesis and application as electrolyte in low-temperature solid oxide fuel cells. Int J Hydrogen Energy 2011:1–8.
[23] Di J, Chen M, Wang C, Zheng J, Fan L, Zhu B. Samarium doped ceria–$(Li/Na)_2CO_3$ composite electrolyte and its electrochemical properties in low temperature solid oxide fuel cell. J Power Sources 2010;195:4695–9.
[24] Raza R, Wang X, Ma Y, Huang Y, Zhu B. Enhancement of conductivity in ceria–carbonate nanocomposites for LTSOFCs. J Nano Res 2009;6:197–203.
[25] Wang X, Ying M, Li S, Kashyout AH, Zhu B, Muhammed M. Ceria-based nanocomposite with simultaneous proton and oxygen ion conductivity for low-temperature solid oxide fuel cells. J Power Sources 2011;196:2754–8.
[26] Wang X, Ying M, Raza R, Muhammed M, Zhu B. Novel core–shell SDC/amorphous Na2CO3 nanocomposite electrolyte for low-temperature SOFCs. Electrochem Commun 2008;10:1617–20.
[27] Abbas G. J Fuel Cell Sci Technol 2011;08(04).
[28] Huang B, Li F, Yu Q, Chen G, Zhao B, Hu K. J Power Sources 2004;128:135–44.
[29] Fan L, Zhu B, Wang C, Raza R, Qin H, Wang X, et al. High performance transition metal oxide composite cathode for low temperature solid oxide fuel cells. J Power Sources 2012;203:65–71.

[1] 10.1016/j.ijhydene.2013.05.060
