

佐賀大学肥前セラミック研究センター

国際セミナー『伝統的磁器の最近の発展』の開催について

このたび、佐賀大学肥前セラミック研究センターによる「2021 年度国際セミナー 伝統的磁器の最近の発展」を下記により開催します。

講師に景德鎮陶瓷大学芸術文博学院の Junming Wu 教授と韓国窯業技術院(KICET)利川分院の Jaegyem Kim 氏とを招き、伝統的磁器に関する研究について講演を行っていただきます。

皆様ご存知のように、景德鎮は中国の代表的な陶磁器の産地の一つであり、今回、景德鎮の陶磁器の生産をサイエンスの観点からお話しいただく機会が得られました。また、韓国窯業技術院と当センターとは平成 31 年 1 月に国際研究交流 MOU を締結して研究交流を進めており、今回、その一環として、研究の一端をご紹介します。

皆様、奮ってご参加いただきますようお願い申し上げます。

記

日 時: 令和 3 年 7 月 30 日(金曜日)16 時 00 分～17 時 30 分

場 所: Web 配信(Webex を利用予定)

主 催: 佐賀大学肥前セラミック研究センター

発 表 言 語: 英語

参 加 方 法: 参加費無料(事前申込みが必要です。[こちら](#)からお申し込みください。)

プログラム:

16:00-16:05 開会挨拶

矢田光徳・佐賀大学肥前セラミック研究センター長

16:05-16:45 講演 1「リートベルト法による磁器の相組成と強度の関係に関する研究」

金宰謙 (Jaegyem Kim) 韓国窯業技術院利川分院 博士研究員

16:45-17:25 講演2 「景德鎮の伝統的な磁器の生産工程におけるサイエンス」

呉軍明 (Junming Wu) 景德鎮陶瓷大学芸術文博学院 教授

17:25-17:30 閉会挨拶

郝棟 (Dong Hao) 佐賀大学肥前セラミック研究センター 助教

※ 講演 30 分、質疑応答 10 分

The poster is for an international seminar held by the Saga University Haman Ceramic Research Center. The title is '国際セミナー 伝統的磁器の最近の発展' (International Seminar: Recent Development of Traditional Ceramics). The event is scheduled for July 30, 2021, from 16:00 onwards, and will be broadcast via Webex. The program includes a welcome reception at 16:00-16:05 by Arita Mitsunobu, followed by a presentation at 16:05-16:45 by Jaegyeom Kim on the relationship between composition and strength of ceramics. The main presentation at 16:45-17:25 is by Junming Wu on the science of traditional ceramic production in Jingdezhen. The seminar concludes with a closing reception at 17:25-17:30 by Dong Hao. The poster also features a QR code for registration and contact information for the center.

佐賀大学 肥前セラミック研究センター

国際セミナー
伝統的磁器の最近の発展

16:00-16:05 閉会挨拶
矢田光徳 佐賀大学肥前セラミック研究センター長

16:05-16:45 「リートベルト法による磁器の
相組成と強度の関係に関する研究」
金宰諤 (Jaegyeom Kim)
韓国産業技術院利川分院 博士研究員

16:45-17:25 「景德鎮の伝統的な磁器の
生産工程におけるサイエンス」
呉軍明 (Junming Wu)
景德鎮陶瓷大学芸術文博学院 教授

17:25-17:30 閉会挨拶
郝棟 (Dong Hao)
佐賀大学肥前セラミック研究センター 助教

日時 2021年
7月30日 金 16:00~, Webexにより配信

発表言語: 英語
参加方法: 事前申込みが必要です。メールまたはこちらからお申し込みください。

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The relation between phase composition and strength of porcelain using the Rietveld method

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Keywords: Porcelain, High strength, Rietveld method, Quantitative phase analysis

Powder X-ray diffraction is the best available technique for the identification and quantification of crystalline mixture materials. Since H. Rietveld developed a whole pattern fitting structure refinement based on the powder X-ray diffraction data in 1969, the refinement procedure is called “Rietveld refinement”. The Rietveld refinement method is currently the most useful tool to obtain direct quantitative phase analysis of complex materials. Inherent advantages of this method have increased its application to nearly all classes of crystalline materials. The Rietveld method is also useful to indirectly determine the amorphous content by adding a suitable crystalline standard. Typical porcelain bodies are made from materials collected from selected deposits using different mixing proportions of clay, feldspar and quartz, which are heat-treated to form a mixture of glass and crystalline phases. The phase proportion is very important factor to affect the physical properties of porcelains. Thus, phase determination and quantification are of special importance in the study of porcelain materials. In this work, alumina, mullite, and cordierite powder were added to a whiteware porcelain slurry and fired at 1280 °C to investigate the correlation between porcelain composition and strength. A Rietveld quantitative analysis indicated that the amorphous phase decreased with increasing additional alumina and mullite content, while the amorphous content remained constant regardless of the additional cordierite content. The decrease in the amorphous content increased the strength of the porcelain, which, in the case of the sample with 15 wt.% alumina, increased by 57%. The dramatic increase in strength is attributed to the increase in residual stress due to the difference in the thermal expansion coefficient between the alumina and the amorphous phase, as well as the increased formation of mullite by the addition of alumina.

Biography



Jaegyeom Kim received the Ph.D. degree in applied chemistry from the Ajou University in 2019. He is currently a Postdoctoral Researcher at Icheon Branch of Korean Institute of Ceramic Engineering and Technology (KICET). His research interests include energy storage materials, thermal conductive materials and porcelain. He has published papers related to crystal structure analysis. His research method combines crystal structure and material properties (physical, electrical, chemical, etc). His research aims to design

crystal structures that exhibit desired properties.

Science of traditional porcelain making in Jingdezhen

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Jingdezhen, the centuries-old porcelain capital, not only has a long history of porcelain making, aboveground and underground historical relics are rich, but also created a lot of excellent porcelain making skills, and it has been preserved and used to this day. These excellent traditional porcelain making skills are a group of precious and important historical and cultural heritage. At the same time, it also contains rich scientific content, which is worth studying and revealing. Both in raw material preparation, raw material processing or molding process firing process and other aspects, Jingdezhen still retains a lot of traditional skills. So what sustains it for so long? What are the scientific implications? What is the influence to the formation of porcelain capital status? (The scientific nature of lime ash preparation is introduced emphatically, Scientific nature of water-borne porcelain stone raw materials, the scientific nature of Zhenyao (firewood kiln invented by Jingdezhen)).

Biography



Junming Wu, PH.D., Professor, Master Supervisor, Leader of Jiangxi Intangible Cultural Heritage Research Base, Leader of popular science education base in Jiangxi province, Director of Jingdezhen Science Popularization Education Base, Young Jing gang Scholar of Jiangxi Province, reviewer expert of Journal *Analytical Methods* of the Royal Society of Chemistry, review expert of National Natural Science Foundation of China project, Member of the First Council of Ceramic Intangible Cultural Heritage Inheritance Science and Technology

Alliance. He is mainly engaged in the research and teaching of ceramic technology history, ceramic archaeology, cultural heritage and ceramic cultural creative industry, Especially in Jingdezhen ceramic intangible cultural heritage scientific connotation exploration, a great deal of research work has been carried out on inheritance, protection, development and utilization, and has made some stage research results, which includes the scientific principle of Jingdezhen traditional lime ash preparation technology and the process simulation of the preparation technology of ancient famous porcelain, and so on.