

第78回フロンティア材料研究所講演会

40 years of research: development of tailor-made glass-ceramics

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Ivoclar Vivadent Ltd., Liechtenstein

日時：9月21日(金) 午後3：30－5：00

場所：S8棟(元素キューブ) 1F ホール

ヘランド博士は、ガラスからセラミックスをつくる結晶化ガラス（Glass-Ceramics）の研究の専門家で、ドイツのイエナー大学オット・ショット研究所の所長を務めた後、現在の企業に転じて、大学で開発した歯科用のセラミックスの実用化をしました。本セミナーはこれまでの研究を紹介してもらいます。以下、要旨です

Glass-ceramics possess the specialty of enabling the combination of different properties within one material. Therefore, the development of tailor-made glass-ceramics is possible. This requires to develop different multicomponent chemical parent glass systems and to apply different nucleation and crystallization mechanisms.

The main focus of the lecture is the presentation of twofold or even multifold nucleation and crystallization mechanisms. Combinations of different internal (volume) mechanisms, but also the combination of internal and surface nucleation mechanisms will be explained. Developing different multicomponent parent glasses and applying the multifold nucleation and crystallization mechanisms allows to control the following properties of biomaterials for dental restoration of biomaterials for human medicine:

- a) high CTE, translucency and high durability
- b) optical properties including translucency as well as opalescence
- c) variety of CTE values and high mechanical strength and radiopacity
- d) bioactivity and machinability.

But also glass-ceramics for technical applications will be presented. These glass-ceramics are characterized by preferred machinability and magnetism.

The processing technologies to produce the final technical, medical or dental products will be explained as molding, machining or slurry technology with the possibility of rapid prototyping. Final products as dental biomaterials will be presented as dental inlays, onlays, veneers, dental layering materials, dental crowns and dental bridges. In total of all these developed glass-ceramic products: more than 288 Mio single dental glass-ceramic units for patients were fabricated worldwide.

担当：細野秀雄（内線 5009）