工艺参数对钛/瓷界面组织及性能的影响

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摘要　应用扫描电镜、能谱、X射线衍射及电子拉伸试验机对钛/瓷界面的微观组织和力学性能进行了研究。结果表明，钛/瓷界面由钛表面氧化膜层和瓷与氧化膜层作用形成的反应层组成，烤瓷工艺参数直接影响钛/瓷界面结构、结合强度和断裂位置。烤瓷温度对钛/瓷界面结合强度影响较大，烤瓷温度为800 ℃、烤瓷时间为1 min时，钛/瓷界面三点弯曲结合强度为24.7 MPa。随着烤瓷温度的提高和烤瓷时间的延长，钛表面氧化膜层和反应层变宽，最终影响钛/瓷界面的结合强度。

Effects of technology parameters on microstructure and mechanical properties at the interface between porcelain and titanium

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Abstract The microstructure and mechanical properties at the interface between porcelain and titanium were studied using SEM,EDS,XRD and electron tensile testing machine.The results show that the interface between porcelain and titanium is composed of oxide layer formed on titanium and reaction zone between oxide layer and porcelain,the technology parameters have great effects on the microstructure of interface,the bonding strength and fracture position.Among them, the firing temperature demonstrates great effect on the bonding strength between the porcelain and titanium, wnich is 24.7 MPa under a firing condition of 800 ℃ and 1 min holding time. With the increase of firing temperature and time,the thickness of the oxide layer and reaction zone rise,which influences the bonding strength of porcelain to titanium finally.

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