

夜视技术

红外用CVD ZnS多晶材料的研制

杨海, 霍承松, 余怀之, 付利刚, 石红春, 鲁泥藕, 黄万才, 孙加滢, 郑冉, 苏小平

北京有色金属研究总院北京国晶辉红外光学科技有限公司, 北京 100088

收稿日期 修回日期 网络版发布日期 2008-2-2 接受日期

摘要 论述了制备红外用CVD ZnS多晶材料的化学气相沉积工艺和热等静压处理工艺。针对CVD ZnS多晶材料具备优良的光学和力学性能, 采用化学气相沉积工艺和热等静压处理技术成功研制出大尺寸多晶材料, 其最大尺寸达到250mm×15mm。测试了CVD ZnS样品的各项光学、力学性能指标。样品的全波段透过率均接近ZnS材料的本征水平, 折射指数均匀性优于 2×10^{-5} , 在 $1.06 \mu\text{m}$ 的吸收系数为 $2 \times 10^{-3} \text{cm}^{-1}$, 抗弯强度达到104MPa。

关键词 [CVD ZnS](#) [化学气相沉积](#) [热等静压处理](#)

分类号 [TN213](#)

Preparation of CVD ZnS polycrystalline material for infrared optics

YANG Hai, HUO Cheng-song, YU Huai-zhi, FU Li-gang, SHI Hong-chun, LU Ni-ou, HUANG Wan-cai, SUN Jia-ying, ZHENG Ran, SU Xiao-ping

Beijing Guojing Infrared Optical Technology Co., Ltd., General Research Institute for Non-Ferrous Metals, Beijing 100088, China

Abstract Chemical vapor deposited zinc sulfide (CVD ZnS) is a long-wave infrared material with excellent optical and mechanical properties. CVD ZnS windows and domes with bulk size up to 250mm×15mm were prepared by chemical vapor deposition and hot isolated pressing. Technical issues for preparation of CVD ZnS, including chemical reaction, hot isolated pressing, control of flow pattern and equipment, are discussed. Optical and mechanical properties of CVD ZnS were measured and analyzed. The full-band transmittance of the samples is close to the theoretical value of ZnS, the inhomogeneity of refractive index at $0.6328 \mu\text{m}$ is less than 2×10^{-5} , the bulk absorption at $1.06 \mu\text{m}$ is $2 \times 10^{-3} \text{cm}^{-1}$ and bending strength is 104MPa. The result indicates that the quality of CVD ZnS is similar to that of American products.

Key words [CVD ZnS](#) [chemical vapor deposition](#) [hot isolated pressing](#)

DOI:

通讯作者 霍承松 cshuo99@163.com

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