

藏药佐太炼制辅料能持八矿灰的化学成分和结构分析^{*}

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摘要 目的: 对藏药佐太炼制辅料能持八矿灰的化学成分和微观结构进行分析, 试探明佐太炼制物质基础。方法: 采用扫描电镜 - X 射线能谱(SEM - EDX) 和 X - 射线衍射(XRD) 分别对不同来源能持八矿灰(由云母灰和七元灰组成) 样品中元素成分和微观结构进行分析。结果: SEM - EDX 分析发现, 云母灰中主要元素为 C、O、Mg、Al、Si、K、Fe, 另外还含有少量的 F、Na、P、S、Cl、Ca、Ti、Cu、Zn、As 等元素; 七元灰中主要元素为 C、O、S、K、Fe、Na, 另外还含有 Al、Si、Cl、Ca、Cu、Zn、As 等元素。XRD 结构分析发现, 云母灰中存在单斜晶系 $K(Mg, Fe)_3(Al, Fe)Si_3O_{10}(OH, F)_2$ 、单斜晶系 $KMg_3Si_3AlO_{10}(F, OH)_2$ 、斜方晶系 Mg_2SiO_4 、六方晶系 SiO_2 、三斜晶系 $(Na_{0.4}Ca_{0.6})Al_{1.6}Si_{2.4}O_8$ 、六方晶系 FeS 等物相; 七元灰中存在六方晶系 SiO_2 、斜方六面体晶系 $CaCO_3$ 、单斜晶系 $K_2Ca(SO_4)_2 \cdot H_2O$ 、斜方晶系 $FeAs_2$ 、斜方晶系 FeAs、正方晶系 Fe_2As 、立方晶系 KCl、立方晶系 Cu_2S 、六方晶系 SiO_2 、斜方晶系 AsFe 等物相。结论: 通过扫描电镜 - X 射线能谱和 X - 射线衍射分析, 获得了能持八矿灰的元素组成和微观结构数据, 为探讨佐太炼制的物质基础提供了有力的科学支持。

关键词: 能持八矿灰; 云母灰; 七元灰; 扫描电镜 - X 射线能谱; X - 射线衍射

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Chemical and structural analysis of Nengchi Bakuang ashes in refining of Tibetan medicine Zuotai^{*}

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Abstract **Objective:** To investigate the chemical components and microstructures of Nengchi Bakuang ashes(mica ash and seven minerals ashes) which are adjuvant material in the refining of Tibetan medicine Zuotai(gTSo thal) , in order to explore the material basis of the refining of Zuotai. **Methods:** Scanning electron microscope - energy dispersive spectrometer(SEM - EDX) and X - ray diffraction(XRD) were used to measure Nengchi Bakuang ashes. **Results:** SEM - EDX analysis show that the main elements in mica ash are C, O, Mg, Al, Si, K and Fe, also contain some kinds minor elements, such as F, Na, P, S, Cl, Ca, Ti, Cu, Zn, As, et al; that the main elements in seven minerals ashes are C, O, S, K, Fe and Na, also contain some kinds minor elements, such as Al, Si, Cl, Ca, Cu, Zn, As. XRD analysis show that the substance forms in mica ash are $K(Mg, Fe)_3(Al, Fe)Si_3O_{10}(OH, F)_2$ (monoclinic) , $KMg_3Si_3AlO_{10}(F, OH)_2$ (monoclinic) , Mg_2SiO_4 (monoclinic) , SiO_2 (hexagonal) , $(Na_{0.4}Ca_{0.6})Al_{1.6}Si_{2.4}O_8$ (triclinic) , FeS (hexagonal) , et al; that the substance forms in seven mineral ashes are SiO_2 (hexagonal) , $CaCO_3$ (rhombohedral) , $K_2Ca(SO_4)_2 \cdot H_2O$ (monoclinic) , $FeAs_2$ (orthorhombic) , FeAs (orthorhombic) , Fe_2As (tetragonal) , KCl (cubic) , Cu_2S (cubic) , SiO_2 (hexagonal) , AsFe (orthorhombic) and so on. **Conclusion:** The present research have acquired the datum of elements and microstructure of Nengchi Bakuang ashes by SEM - EDX and XRD techniques, and that is benefit to explore the material basis of refining Zuotai.

Key words: Nengchi Bakuang ashes; mica ash; seven minerals ashes; Zuotai; SEM - EDX; XRD

藏医药是我国传统民族医药中的一支奇葩, 以其独特的用药理念和神奇疗效而著称于世。藏药佐