Werk

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Kontakt/Contact

Digizeitschriften e.V.
SUB Göttingen
Platz der Göttinger Sieben 1
37073 Göttingen

info@digizeitschriften.de

krystalu. Takové stopy na filmu mohou vésti k omylu, že se jedná o vady krystalu, lze je však příslušným stočením kol osy kolmé k ose spektrografu a povrchové ploše krystalu vymýtiti.

Tyto zjevy, později zmíněné, nemají sice významu při přesném měření, mají však význam při chemické analyse nebo při hledání nových čar, kdy se pracuje s krystaly otáčenými kol osy spektrografu ve velkém rozmezí, ježto lze pak očekávati výskyt takových „nedovolených reflexí" u většiny krystalů.

Z uvedeného je patrno, že lze krystalů nedokonale štěpných nerostů, které se obvykle vyznačují velkou reflekční intensitou vyvolanou silnou mosaikou, nebo krystalů uměle zbroušených a leštěných použíti stejně dobře k přesnému měření jako krystalů dokonalých za předpokladu, že tyto krystaly vhodně orientujeme. Rovněž výskytu „nedovolených reflexí", které mohou vaditi při fokusačních metodách a při analyse, lze zabrániti vhodnou orientaci krystalu.

Na konci práce vzdávám uctivý dík p. prof. dr. V. Dolejškovi za cenné pokyny a informace a p. prof. dr. F. Ulrichovi za ověření odchylek povrchových rovin krystalů sfaleritu přímým proměřením krystalografických úhlů příslušných exemplářů krystalů.

Spektroskopický ústav Karlovy university.

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The influence of imperfect cleavability of crystals on the accuracy of measurements in the X-rays spectroscopy.

(Abstract of the preceding paper.)

Owing to an imperfect cleavability, crystals of some minerals are split step-like (microscopically). This causes a non-conformity between the surface plane of the crystal adjusted in the axis of the spectrograph and the plane of Bragg's reflection. These crystals behave in an analogical way to those artificially ground. Considerable deviations of this kind of the Bragg's reflecting planes from the natural surface plane of crystal were ascertained by us in the case of sphallerite (ZnS) which possesses a considerable reflecting power and which owing to its small lattice constant is very advantageous for X-spectroscopy.

In consequence of the non-conformity of the surface plane of the crystal (which is adjusted into the axis of spectrograph) with the plane of Bragg's reflections, a displacement of the lines takes place when such crystals are used for the most accurate measurements in the X-spectroscopy. In this case, however, the image of the reflected lines stay parallel one to another and also to the axis of the spectrograph (in contradistinction to cases of erroneous

adjustement). The displacement of lines effected by this imperfection of crystals can have a considerable influence in the exact determination of the lattice constant; nevertheless these displacements can be eliminated if the crystal is oriented so that the line of intersection of both planes, i. e. that of Bragg's reflections and that of the crystal surface is parallel to the axis of the spectrograph. Each crystal has two such characteristic positions. One is marked out by the maximum, the other by the minimum intensity of the reflection. This is due to the fact that in former case the reflected beam travels through the minimum path, while in the later case through the maximum path in the crystal medium. Though both of the characteristic positions exclude the displacements of lines described above, it is but the position characterized by the maximum intensity which is suitable for accurate measurements. This fact is due not only to the larger intensity of reflection but also to the reason that the reflected beam is in this position less deviated by refraction than in the other case.

Using such crystals there appear very often reflections comming from other crystallographic planes than from the scissible ones. These reflections can have the appearance of „spirits" similar to those obtained with optical gratings but they can have also the appearance of normal sharply defined lines which often lead to an error in spectral analysis, especially when very lumineous methods like for instance focussing methods are used. However, these lines can be easily eliminated by a suitable turn of the crystal around the axis perpendicular to the surface plane of crystal and to the axis of the spectrograph.
