

TECHNICAL NOTE



SPI Supplies
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SPI Chem Phlogopite Mica

Introduction

Generally speaking, the kinds of people who use muscovite mica substrates (and look at them with microscopy) want very smooth surfaces. The mica mineral phlogopite, when it is cleaved, results in a rougher surface. The mineral also lacks the high optical clarity of muscovite, at least when talking about grades V-4 or better. But there are some significant differences between the more common muscovite form of mica vs. the less familiar phlogopite form of mica.

For one thing, there is no equivalent to the "grading" scheme as there is for the muscovite form of mica since that scheme is based on optical clarity (which phlogopite clearly does not have) and the presence (or absence) of iron oxide and other inclusions, which phlogopite seems to not have at all. So while there are some differences in what one might call "quality", such differences have to be characterized and measured via a scheme entirely different than the one used for the characterization and grading of muscovite mica (e.g. V-1, V-2, etc.). When cleaved, the sheets are flexible and elastic, and can be bent and will flex back elastically to their original flatness. Thin flakes show a property known as asterism or a six pointed star when a light source is viewed through the crystal which is caused by the presence of inclusions.

Applications for phlogopite:

Some researchers would express a preference for phlogopite because they want to benefit from its higher melting point (~1800°C vs. ~ 1600°C for muscovite). Yet others might want a substrate that is free of iron oxide impurities but at a lower price than the top grades of muscovite (e.g. V-1 and V-2). Another group of users prefer phlogopite because the cleaved surface, being rougher, contains more surface area and this could be important where issues of adhesion are involved.

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