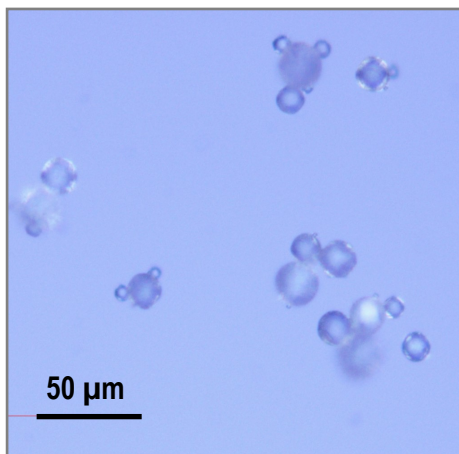


Products



Ruby Micro Balls

RELATED PRODUCTS:

- Ruby powder
- Optiprex PLS
- Optiprex RubyLUX

Both optical devices suitable to measure the Ruby fluorescence. Various configurations and options available. Contact us for more details:

sales@almax-easyLab.com

Ruby micro balls ($\text{Al}_2\text{O}_3:\text{Cr}^{3+}$)

Almax easyLab can supply Ruby micro balls as pressure calibrant for diamond anvil cell experiments. Ruby fluorescence is a well known technique for in-situ sample pressure measurement in DAC experiments at ambient or low temperature [1].

The Ruby balls (10 mg) are supplied on a microscope glass slide. Their spherical shape is achieved through a specific preparation method where molten doped alumina is forced through a jet, resulting in the formation of small droplets that solidify while in motion.

Unlike the process of crushing large pieces of Ruby, this method ensures the production of individual, stress-free Ruby balls. To further enhance their quality, our Ruby balls undergo multiple heat treatments. This meticulous heating process effectively eliminates any remaining internal stress. As a result, our Ruby balls exhibit distinct and narrow fluorescence lines known as R1 and R2. Typically, the R1 line has a full width at half maximum (FWHM) of approximately 0.6 nm, indicating a precise and focused emission peak.

The Ruby micro balls are easy to identify inside the gasket hole. They have a concentration of chromium of 3000 ppm which is optimum for the fluorescence intensity of the R1 line and the narrow FWHM [2]. The chromium content has been measured accurately using electron microprobe as well as atomic absorption spectroscopy.

Technical Specifications:

Size distribution	5-50 micron
Chromium content	3000 ppm
FWHM	0.6 nm
Ruby weight provided	10 mg

Specifications subject to change without prior notice.
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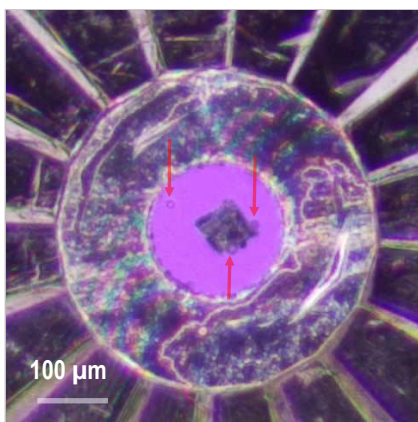
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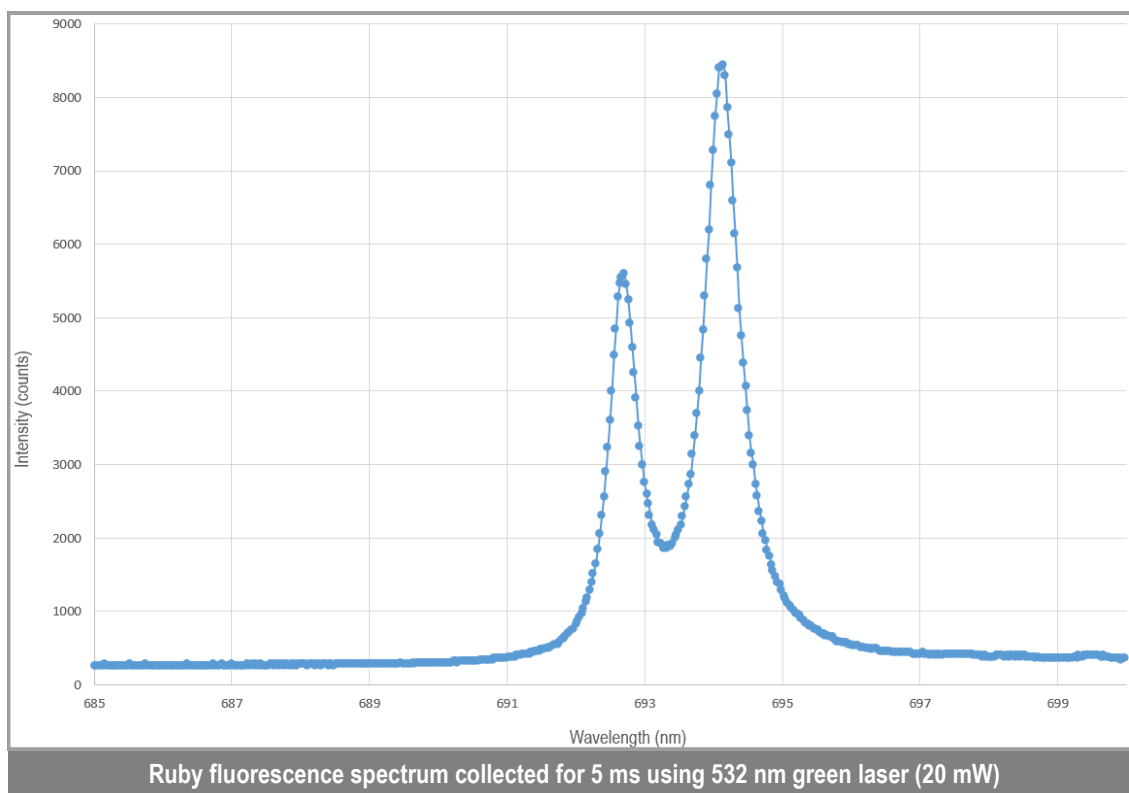




Ruby fluorescence to measure sample pressure:



- ◆ The photo on the left shows the loading of a DAC with a single crystal of tungsten iodide positioned at the centre of the gasket hole. Three Ruby micro balls (approx. 15 micron) are dispersed in the gasket hole (red arrows).
- ◆ Using few Ruby balls in different locations allows to measure the pressure gradient within the sample chamber.
- ◆ At ambient pressure, the typical intensity of the R1 line measured from a 10 micron ruby ball, is roughly 8500 counts in 5 ms acquisition when using a 20mW green laser (532 nm) .



References:

- [1] H. K. Mao, J. Xu, and P. M. Bell, *J. Geophys. Res.* 91, 4673, 1986.
- [2] J.C. Chervin, B. Canny, and M. Mancinelli, *High Pressure Res.* 21:6, 305– 314, 2001