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A simple x-ray pressure cell for the preparation of Xe derivatives

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We have developed a simple device for preparing Xe derivatives and for studying crystalline samples under moderate gaseous pressure (1-100 atm). The device employs a Cajon ultra-torr fitting to ensure a gas-tight seal around a standard x-ray capillary. As such, the cell can accommodate standard x-ray capillaries up to 1.5 mm in diameter without any modification. The device is trivial to employ and samples can be mounted and pressurized in a matter of seconds. In addition, a simple and safe purging and pressurization system has been designed and constructed at beam line 7-1 at the Stanford Synchrotron Radiation Laboratory (SSRL). To date, xenon derivatives have been successfully prepared for 5 different proteins, both in our home laboratories as well as at SSRL. In all cases examined so far, the xenon site has been unique from all other heavy atom sites. The ease and success of xenon derivative preparation is such that xenon has become a standard derivative screen for new protein crystals in our laboratories.