

A Video Demonstration of a Single Crystal X-Ray Determination of Sugar

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With the current global pandemic, there has been a massive and sudden swing towards online learning. While certain fields are easily adaptable to a virtual format, the sciences are especially difficult to teach in an asynchronous format, with laboratory components posing extra hurdles. Overall, the foundation for effective teaching in an online format is video demonstration. This is especially important in topics that are less often taught on a basic level to undergraduate students, such as X-ray Crystallography. As such, we set out to create a video intended to be used as a teaching aid for students completing an X-ray crystallography lab for the first time. Written instructions, while essential and helpful in their own right, are sometimes not enough to fully understand the process. Our step by step video guide sought to walk students through each step of the protocol to provide extra content that is difficult to convey in a written format. Students can follow along as a peer undergraduate chemistry student completes the experiment for the first time, and can begin mastering the topic by seeing it done. Emphasis is placed on common mistakes to avoid, critical steps in the process, and helpful insights provided by the instructor. Following the video in conjunction with physical instructions will provide students with the most comparable experience to a traditional laboratory course. While it is debatable whether online instruction in the sciences will ever fully replace in-person teaching, the past months have highlighted the importance of having materials prepared for a scenario in which they may be needed and as such, these materials should provide the closest replica to an on-the-ground experience as possible.