**Visualizing solid state structures using CrystalMaker generated COLLADA files**

**Creating COLLADA files**

COLLADA (COLLAborative Design Activity) is an interchange file format for interactive 3D applications. You will need to generate these files. They have a .dae (Digital Asset Exchange) filename. You can find more information about this file format on Wikipedia. The structures are easily generated using a licensed version of CrystalMaker ([www.crystalmaker.com](http://www.crystalmaker.com)) on either a Mac or PC.

You will need atomic coordinates for the structure you would like to generate. You can open a CIF (Crystallographic Information File) into CrystalMaker. Once you have displayed the atoms you would like students to see, you can save the structure as a DAE file (File / Export / COLLADA 3D file).

My two favorite sources for crystallographic information for simple solid state structures are:

* Crystal Maker Libraries   
  <http://www.crystalmaker.com/library/index.html>; and
* MSA Crystal Structure Database – mineral structures – specify the cif format  
  (<http://rruff.geo.arizona.edu/AMS/amcsd.php>.

A lot of work goes into “prettying” the files to make them more meaningful to students. Some of the variables I play with include:

* background color;
* ball and stick vs. space filling (I usually don’t use polyhedral mode with my 1st semester inorganic strudents); and
* atom color and transparency (to highlight layers, holes, cells, etc…).

I’ve found it helpful to minimize the number of atoms, otherwise the DAE files get huge!

**Installing StudioViewer**

Studio Viewer is available on iOS and Android for free through the App Store or Google Play. I had trouble searching for the application on my devices and found it easier to go through the download website to open the app in the store.

<https://www.esko.com/en/Support/DownloadsAndLicenses/mobile-apps/>

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iOS icon Android icon

**Opening Files in Studio Viewer**

I uploaded files to my course LMS (Canvas) and had students use the Canvas app to get to the course page that contained these files.

**iOS device.** Open the file of interest. The file will download in xml format. Use the button in the top right hand corner of the screen and select “Copy to Studio Viewer”. The file will open in Studio Viewer.

**Android device.** Open the file of interest. It will open directly in Studio Viewer.