Supporting Information
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Fig. S1. Backscattered electron image and EDS X-ray intensity maps of an area of mixed metal and silicate; the i-phase forms bright haloes near the image center. The backscatter contrast is set low to show that the dark regions are filled with silicate or oxide material and are not voids. The X-ray maps show that most dark areas are spinel-like, dominated by Mg, Al, and O. However, one large dark area is olivine-like, dominated by Mg, Si, and O. Some of the aluminous regions yield crystalline spinel EBSD or XRD patterns; others appear to be amorphous. The CuAl₅ starting material was to the left and the SS304 capsule wall was toward the right.
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Fig. S2. Reconstructed precession figures from the single-crystal X-ray study of the i-phase grain. (A) Viewed down the fivefold symmetry axis. (B) Viewed down the threefold symmetry axis. (C) Viewed down the twofold symmetry axis. These patterns match those predicted for a face-centered icosahedral quasicrystal.
Fig. S3. Comparison of the powder XRD patterns of natural icosahedrite (red) (data courtesy of ref. 5) and the newly synthesized i-phase (black) (the present study). Although background subtraction for the small i-phase sample is imperfect, the similarity of patterns and the systematic peak shift to smaller 2θ angle in the new i-phase are evident.