**SUPPLEMENTARY FILE**

**Figure Captions**

Figure A1. WDS element map of tokyoite associated with noelbensonite. Corresponding BSE image is shown in Fig. 3A (main text).

Figure A2. WDS element map distribution for tokyoite associated with noelbensonite barite and witherite. Corresponding BSE image is shown in Fig. 3B (main text).

Figure A3. WDS element map distribution for tokyoite associated with K-feldspar. Corresponding BSE image is shown in Fig. 3C (main text).

**Tables**

Table 1. Representative electron microprobe analyses of tokyoite, As-rich tokyite and noélbensonite (oxides in wt.%)

Table A1. Electron microprobe analyses of (As-poor) tokyoite (wt%)

Table A2. Electron microprobe analyses of As-rich tokyoite

Table A3. Electron microprobe analyses of noelbensonite