

## **Description of Additional Supplementary Files**

**File Name: Supplementary Data 1**

**Description:** Major and trace element compositions of starting materials.

**File Name: Supplementary Data 2**

**Description:** Major and trace element compositions of experimental peridotite-mélange melts.

**File Name: Supplementary Data 3**

**Description:** Summary of experimental set-up.

**File Name: Supplementary Data 4**

**Description:** Compiled major and trace element compositions of experimental melts from other studies on mantle wedge hybridization.

**File Name: Supplementary Data 5**

**Description:** Major element composition of mineral phases analyzed by EPMA.