----- GENERAL INFORMATION -----

DATA TITLE: Raman spectroscopy of surfaces on ferritic Fe-Cr-Al-Mo alloy Kanthal APMT and Cr-Mo-V steel T91 (UNS: K90901) after oxidation at 1200 C for 2 h
PROJECT TITLE: Materials Characterization of High-Temperature Oxidation on ferritic Fe-Cr-Al-Mo alloy Kanthal APMT and Cr-Mo-V steel T91 (UNS: K90901)
DATA ABSTRACT: Space-delimited text files with Raman spectra data acquired from the surface of ferritic Fe-Cr-Al-Mo alloy Kanthal APMT and Cr-Mo-V steel T91 (UNS: K90901) after oxidation at 1200 C for 2 h in steam and air.

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ASSOCIATED PUBLICATIONS:
T. Copeland-Johnson, C.K.A. Nyamekye, S.K. Gill, L. Ecker, N. Bowler, E.A. Smith, R.B. Rebak, Characterization of Kanthal APMT and T91 oxidation at beyond design-basis accident temperatures, Corros. Sci. (2020).

COLLECTION INFORMATION:
Time period(s): 2017-2019
Location(s): Iowa State University, Brookhaven National Laboratory

----- FILE DIRECTORY -----

----- FILE LIST-----

File Name	Description
Raman_APMT.png	3216 x 2461 pixel resolution image of Raman spectra acquired from APMT after oxidation in air and steam
Raman_APMT.txt	Space-delimited text file of data plotted in Raman_APMT.png
Raman_T91_Air.png	3216 x 2461 pixel resolution image of Raman spectra acquired from T91 after oxidation in air
Raman_T91_Air.txt	Space-delimited text file of data plotted in Raman_T91_Air.png
Raman_T91_Steam.png	3216 x 2461 pixel resolution image of Raman spectra acquired from T91 after oxidation in steam
Raman_T91_Steam.txt	Space-delimited text file of data plotted in Raman_T91_Steam.png

----- METHODS AND MATERIALS -----

----- DATA COLLECTION METHODS -----

The specimens were placed onto a glass slide and irradiated with a 1.44×10^5 W cm^{-2} solid-state 532-nm diode laser producing a 2.95 ± 0.06 μm laser spot size on the specimen surface and analyzed with an Olympus 10× objective (0.25 numerical aperture). A 60 s acquisition time with three accumulations were used for all Raman measurements.

----- DATA PROCESSING METHODS -----

Raman spectra data was plotted using OriginLab 2016. Intensity values of each spectra were normalized from 0 to 1, to allow for comparison between spectra, the minimum intensity assigned as 0 and the maximum intensity assigned as 1.

------- SOFTWARE -------

Name: OriginLab 2016
Version: 64-bit
System Requirements:

Windows: Operating System: 64-bit (x64) Microsoft Windows® 7 SP1, Windows® 8, Windows® 8.1, Windows® 10; Processor: 1.6 GHz 64-bit (x64); Memory: 4 GB RAM (8 GB recommended); Hard Disk Space: 2.0 GB of free hard disk space for program installation + Help files (does not include data storage); Other hardware: USB port or DVD drive (if installing from USB stick or DVD); Browser: The Learning Center dialog requires Internet Explorer version 11.

Mac: Mac users can run Origin by using Microsoft Windows® via Boot Camp or within OS X using third-party virtual machine software.

URL: http://www.originlab.com
Developer: OriginLab Corporation
Additional Notes: N/A

------- EQUIPMENT -------

Manufacturer: HORIBA Scientific
Model: XploRA Plus Raman confocal upright microscope
Embedded Software/Firmware Name: (if applicable) N/A
Embedded Software/Firmware Version: (if applicable) N/A

Additional Notes: Raman shift signal was collected in the epi-direction using a 300 µm confocal pinhole and an 1800 g/mm grating with 3 cm^{-1} resolution.

------- LICENSING -------

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