

## **SUPPLEMENTARY MATERIAL**

### **A RAPID AND DIRECT METHOD FOR DATING BLUE PEN INK IN DOCUMENTS USING MULTISSET MODELING OF INFRARED SPECTROSCOPY AND MASS SPECTROMETRY DATA**

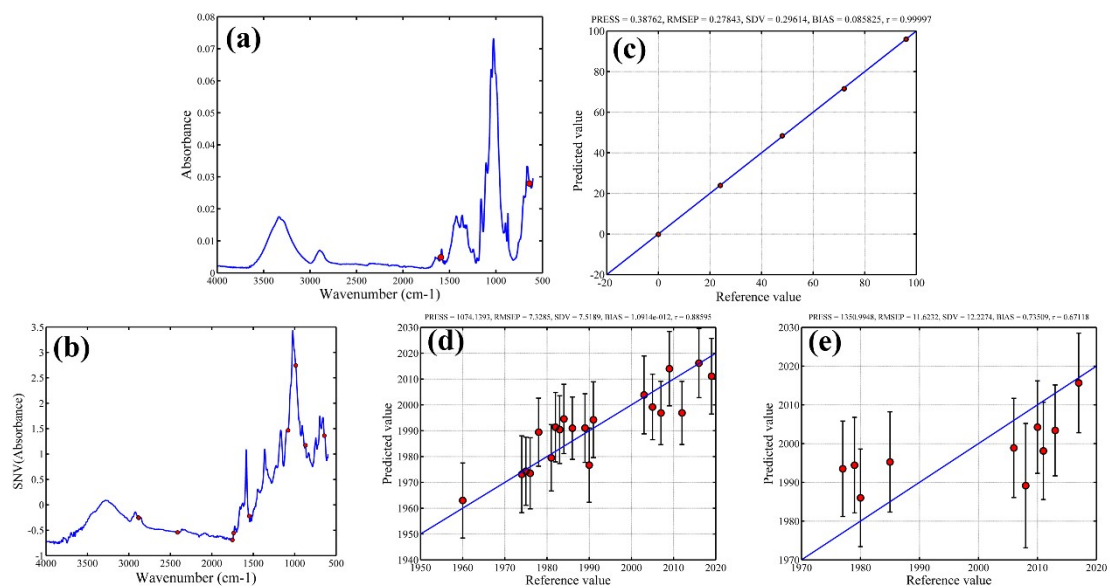
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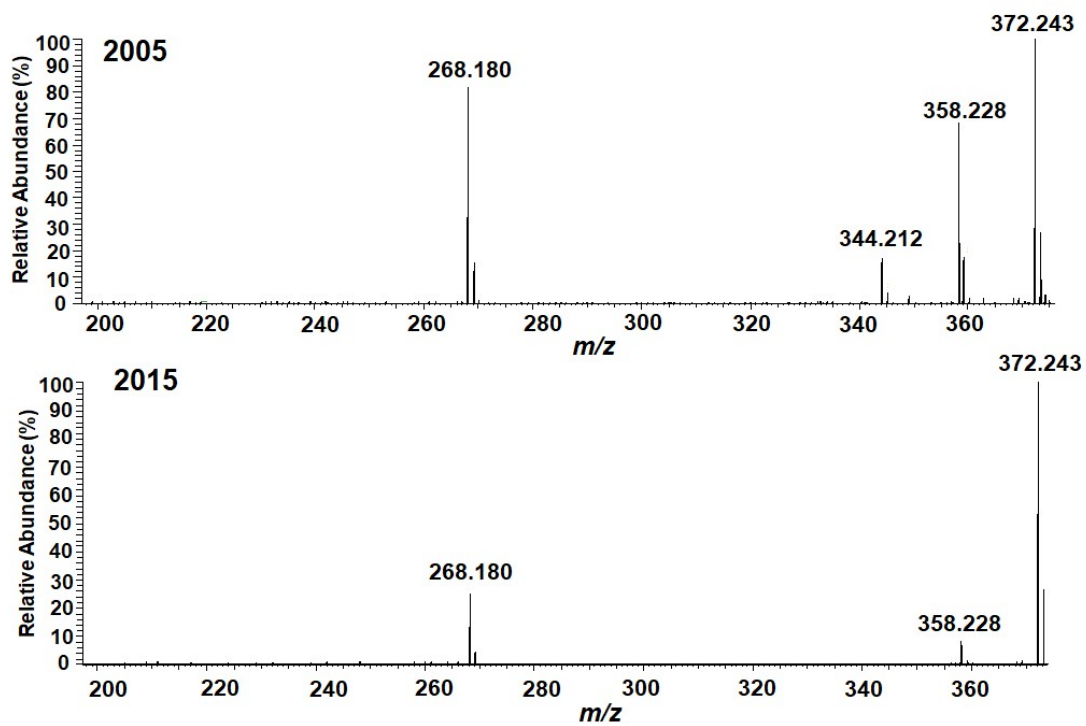
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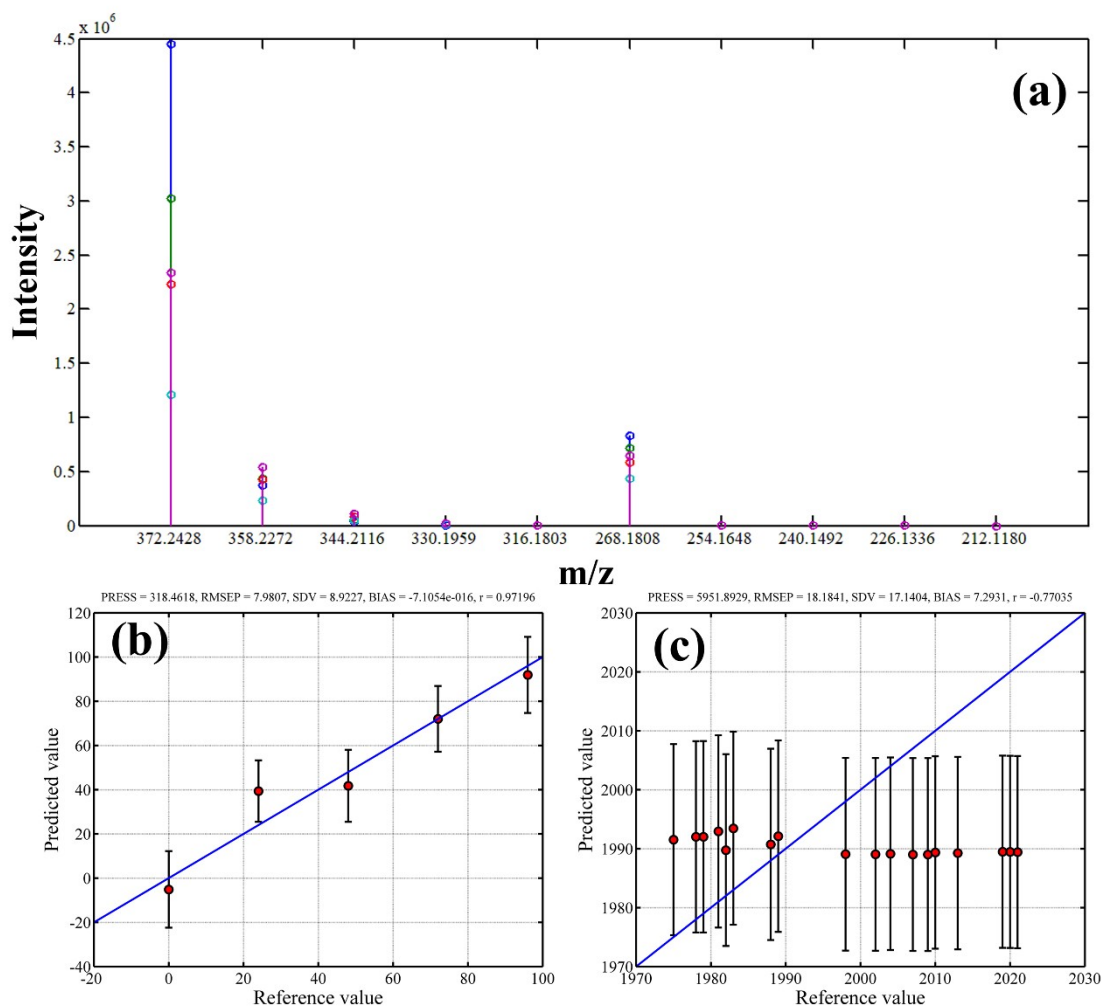
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**Figure S1.** Optimum wavenumbers selected using the GA and employed to construct the MLR models for (a) the artificially aged and (b) the real aged documents. Plots of predicted versus reference degradation time values for the MLR models constructed for (c) the artificially aged documents, (d) the real aged documents training set, and (e) the real aged documents test set. The figures of merit and the error bars for the models are shown in the predicted versus reference value graphs.



**Figure S2.** DESI-MS spectra of blue pen inks from the 2005 and 2015 document samples.



**Figure S3.** (a) DESI-MS values for the artificially aged samples. The BV3 and DG characteristic ions are respectively represented by the  $m/z$  372.2428 and 268.1808 signals and its degradation the following signals with -14 Da differences corresponding to the  $\text{CH}_2$  loss. Predicted versus reference degradation time values for the MLR models constructed for (b) the artificially aged documents and (c) the test set of the real aged documents, using the DESI-MS data. The figures of merit and error bars for the models are shown in the predicted versus reference value graphs.