**Supplementary Information for:**

"High Throughput Quantitation of Artesunate and its Degradation Products by Flow

Injection Gradient Ratio Standard Addition Mass Spectrometry (FI-GRSA-MS)"

Hostetler, D. M. *et al.*

Supplementary Figure S-1: Extracted ion chronograms and subsequent data analysis for the GRSA mass spectral method. The top panels show data obtained for the analysis of a genuine tablet extract that was properly stored and had not appreciably degraded. The green trace represents the sample without standard added to the solution, while the blue trace represents the sample plus standard solution. The y-intercept of the linear fit to the right represents the best statistical estimate of the concentration of artesunate in the investigated solution. (All solutions were diluted to an expected concentration of 1 µM). The lower panels show results for the analysis of the extract of a tablet that was artificially degraded for 12 hours.
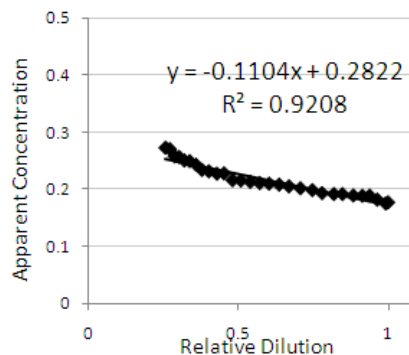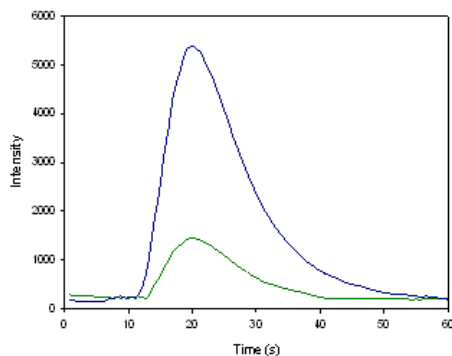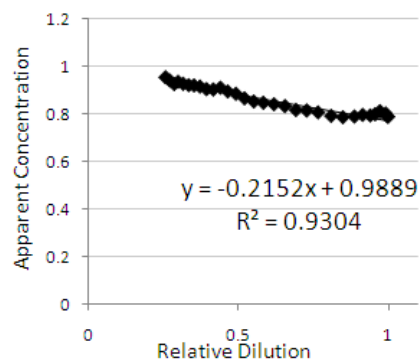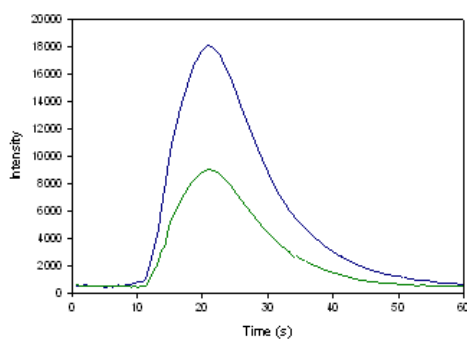
Supplementary Figure S-2: HPLC data versus FI-GRSA-MS data with 95% confidence intervals added. Because the intervals include a slope of one and a y intercept of zero, the accuracy of the FI-GRSA-MS results are verified against a standard method. It should be noted that the data corresponding to the tablet degraded for eight hours was deemed a statistical outlier, and thus was removed from the data set.

$$y = (0.919 \pm 0.126)x + (7.95 \pm 14.34)$$
$$R^2 = 0.983$$
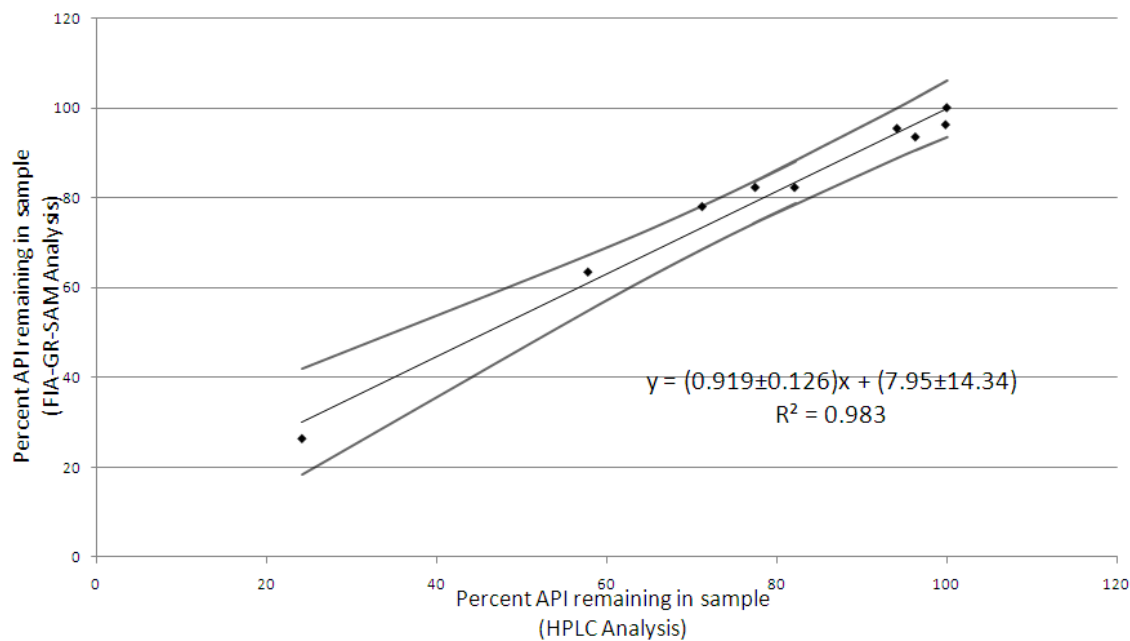
Supplementary Figure S-3: Evolution of relative abundances of various ionic species corresponding to artesunate and its degradation products as a function of degradation time. The signal intensities reported are an average of three FI-GRSA-MS runs. The trend line was determined using the running average of two values per average.
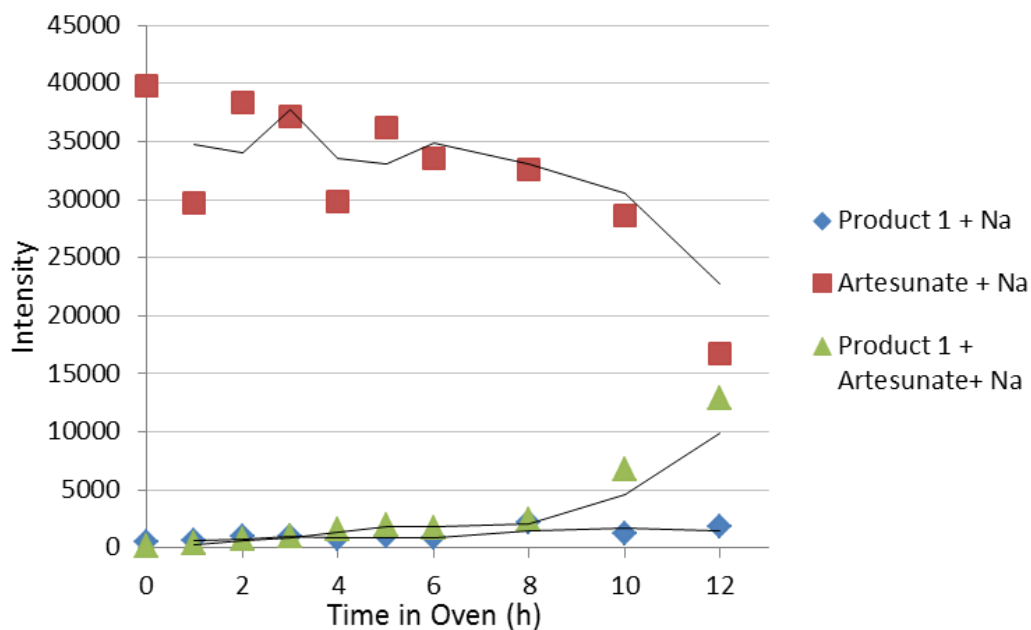
Supplementary Figure S-4: Intensity of dihydroartemisinin-related ionic species as a function of degradation time.
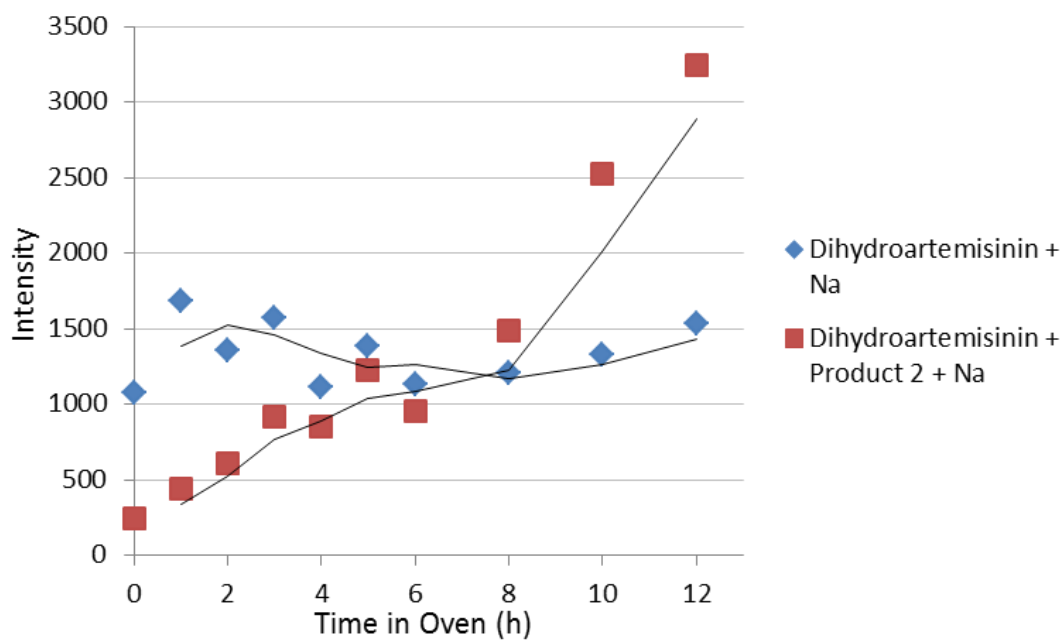
Supplementary Table S-5: Percent API remaining after artesunate tablets manufactured by Guilin Pharmaceuticals were forcibly degraded in the oven at ~105ºC for 12 hours. All experiments were performed by the FI-GRSA-MS method.

Hours in Oven	0	3	6	12
Percent API in Tablet	100	43.2	31.8	8.6
Error (standard deviation of measurements)	1.2	0.9	1.8	2.2