Supporting Information

Controlling the specific enrichment of multi-phosphorylated peptides on oxide materials: Aluminium foil as target plate for laser desorption ionization mass spectrometry.

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SI-1: mathematic simulation

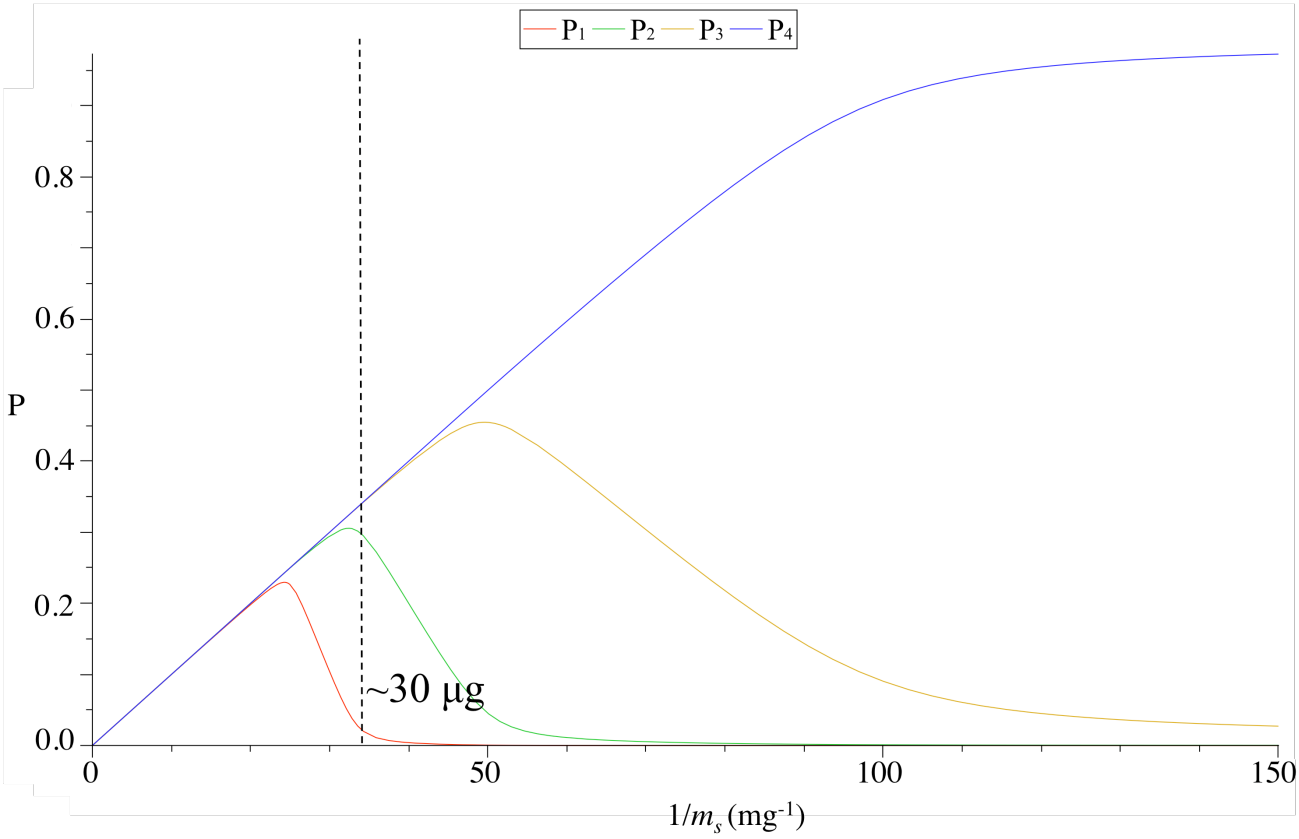

Figure SI-1a: simulated phosphopeptides adsorption equilibrium results as functions of extractor-amounts, the constant condition here are same as that for figure 1a except $k_{on}/k_{off}= 10^8$ M. Comparing to figure 1a, the peak values here for P_1, P_2 and P_3 are increased, but the biggest amount of extractors that can be used for selective extraction of multi-phosphopeptides is still ~ 30 µg, same as what being read from figure 1a.

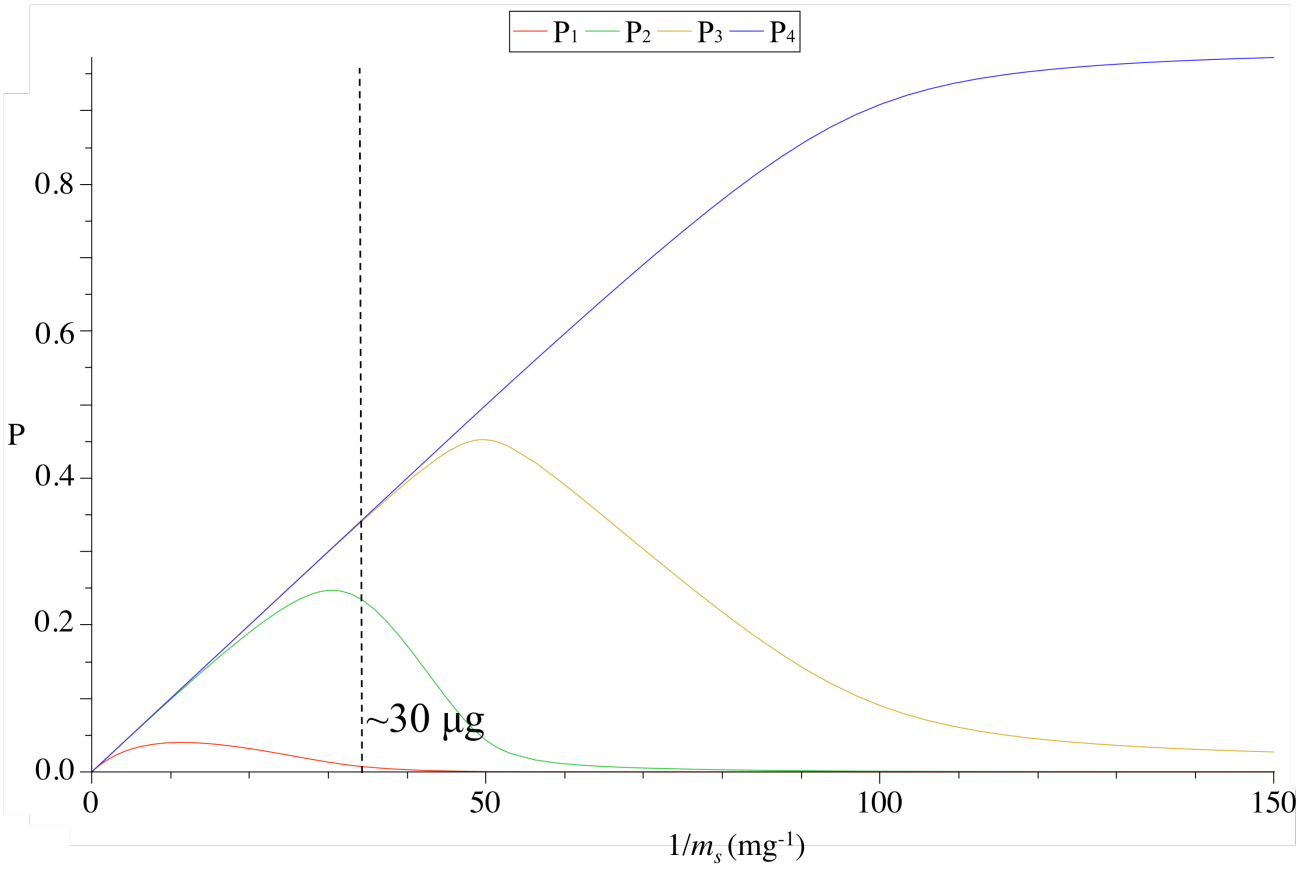

Figure SI-1b: simulated phosphopeptides adsorption equilibrium results as functions of extractor-amounts, the constant condition here are same as that for figure 1a except $k_{on}/k_{off}= 10^5$ M. Comparing to figure 1a, the peak values here for P_1, P_2 and P_3 are decreased, but the biggest amount of extractors that can be used for selective extraction of multi-phosphopeptides is still ~ 30 µg, same as what being read from figure 1a.

SI-2: adsorption equilibrium investigation with peptide mixture and Al@Al_2O_3 powder

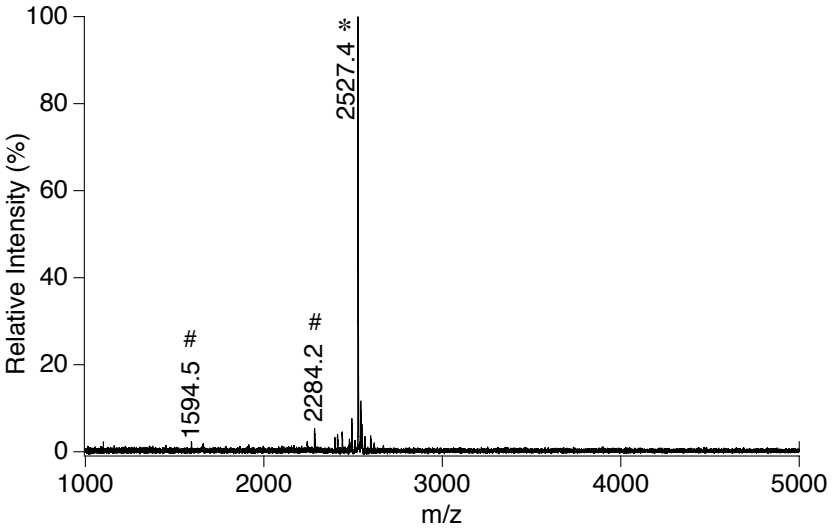

Figure SI-2a: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~4 µg Al@Al_2O_3 powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

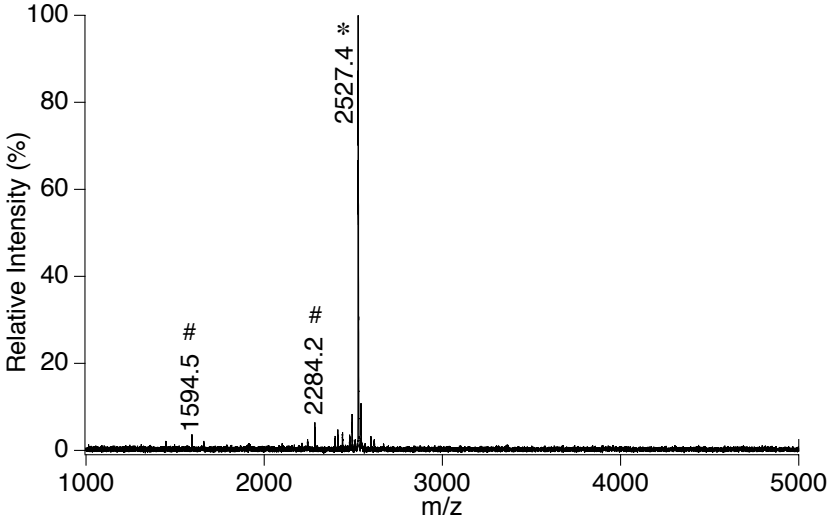

Figure SI-2b: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~10 µg Al@Al_2O_3 powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

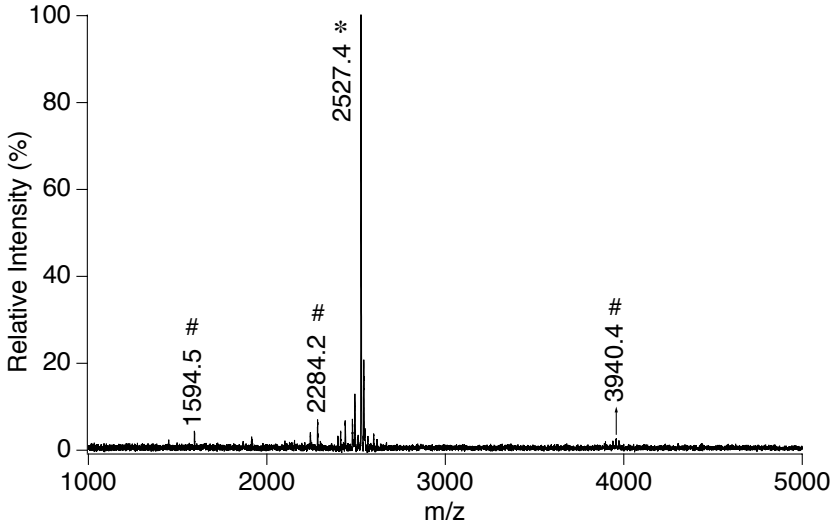

Figure SI-2c: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~40 µg $Al@Al_2O_3$ powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

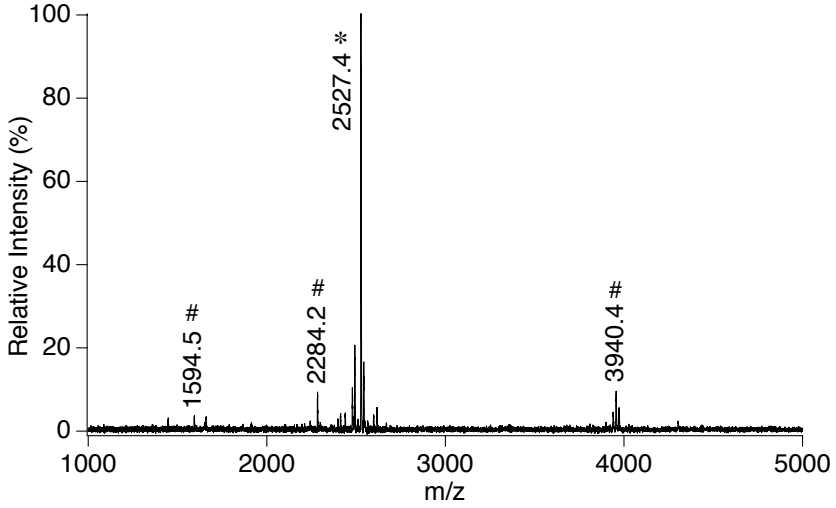

Figure SI-2d: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~100 µg $Al@Al_2O_3$ powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

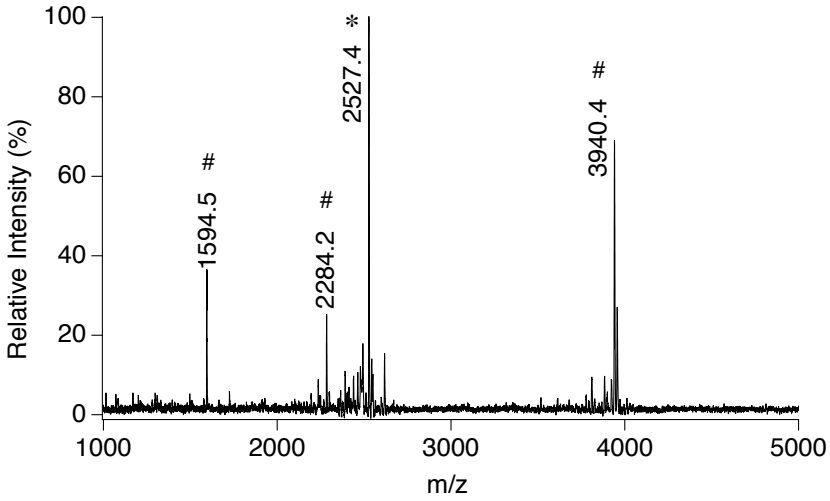

Figure SI-2e: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~200 µg Al@Al_2O_3 powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

SI-3: adsorption equilibrium investigation with peptide mixture and Al_2O_3 powder

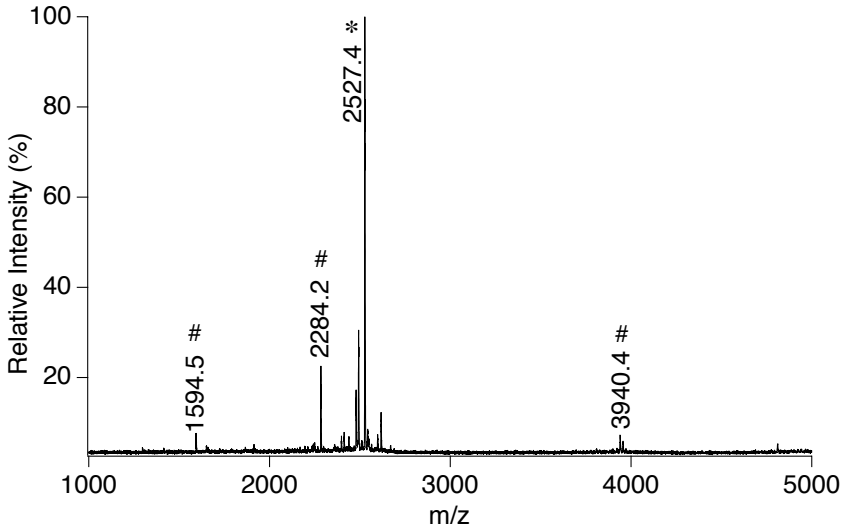

Figure SI-3a: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~2 µg Al_2O_3 powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

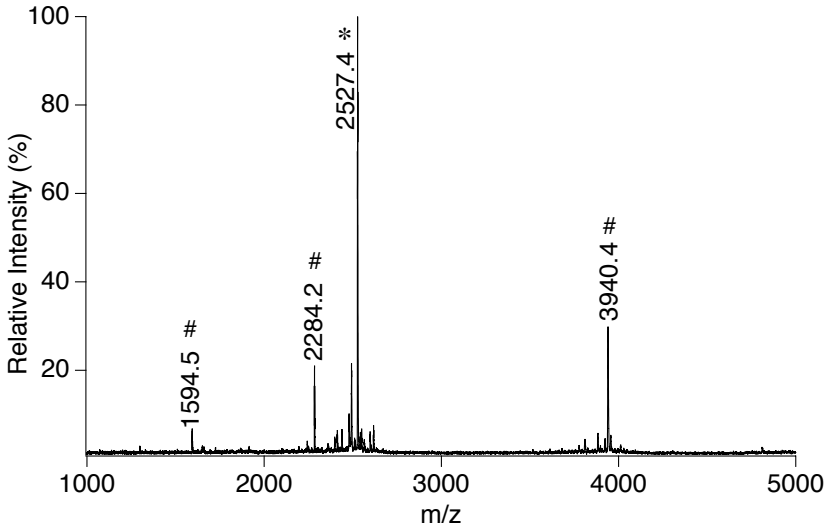

Figure SI-3b: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~4 µg Al_2O_3 powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

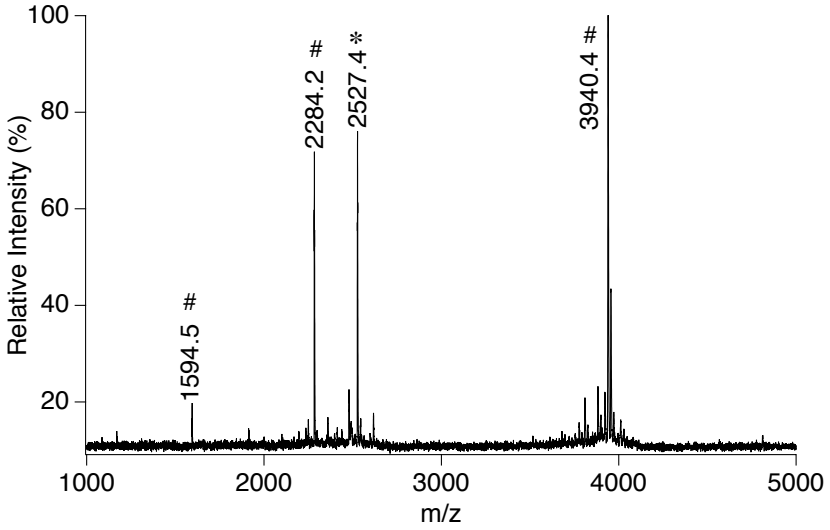

Figure SI-3c: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~10 µg Al_2O_3 powder. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

SI-4: adsorption kinetics investigation with peptide mixture and Al@Al_2O_3 powder

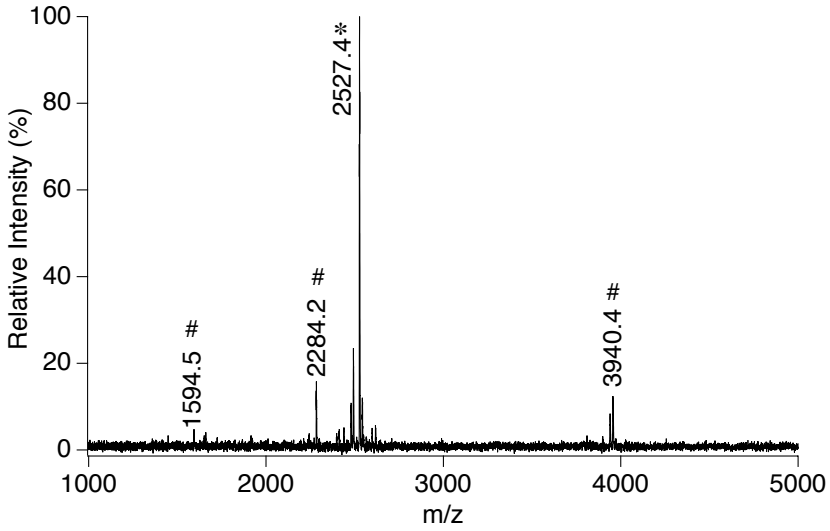

Figure SI-4a: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~20 µg $Al@Al_2O_3$ powder with 1 min incubation. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

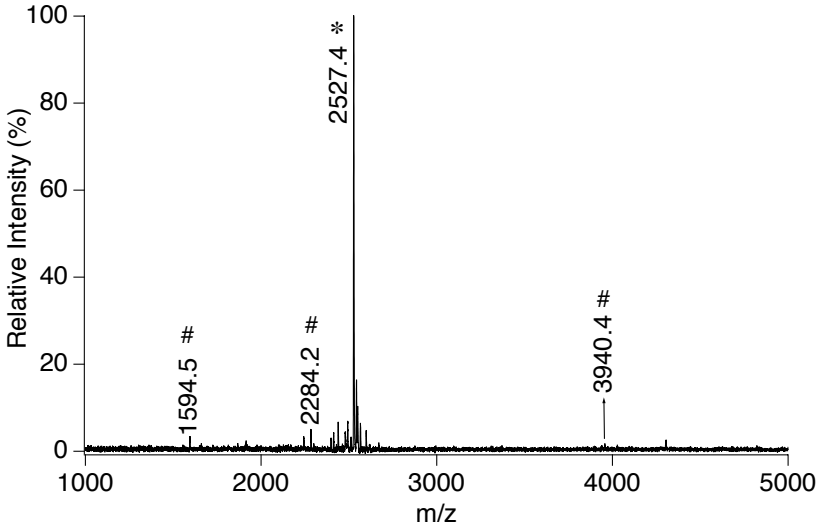

Figure SI-4b: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~20 µg $Al@Al_2O_3$ powder with 6 min incubation. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

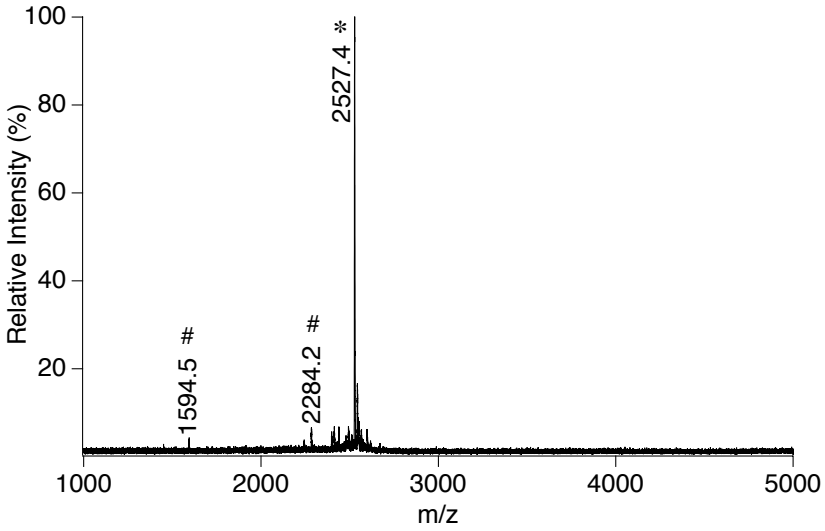

Figure SI-4c: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~20 µg Al@Al_2O_3 powder with 16 min incubation. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks

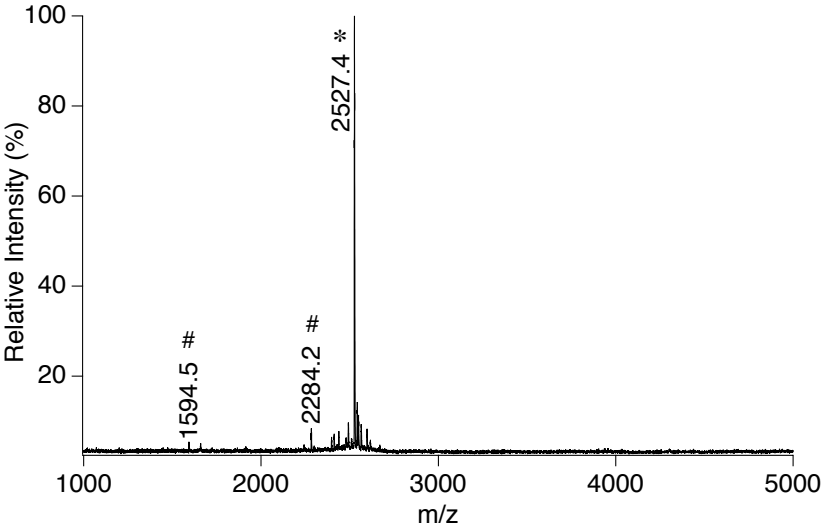

Figure SI-4d: Mass spectrum of peptides extracted from 20 µl 900 nM the four-peptide-mixture by ~20 µg Al@Al_2O_3 powder with 31 min incubation. *: multi-phosphopeptides related peaks; #: single-phosphopeptides related peaks