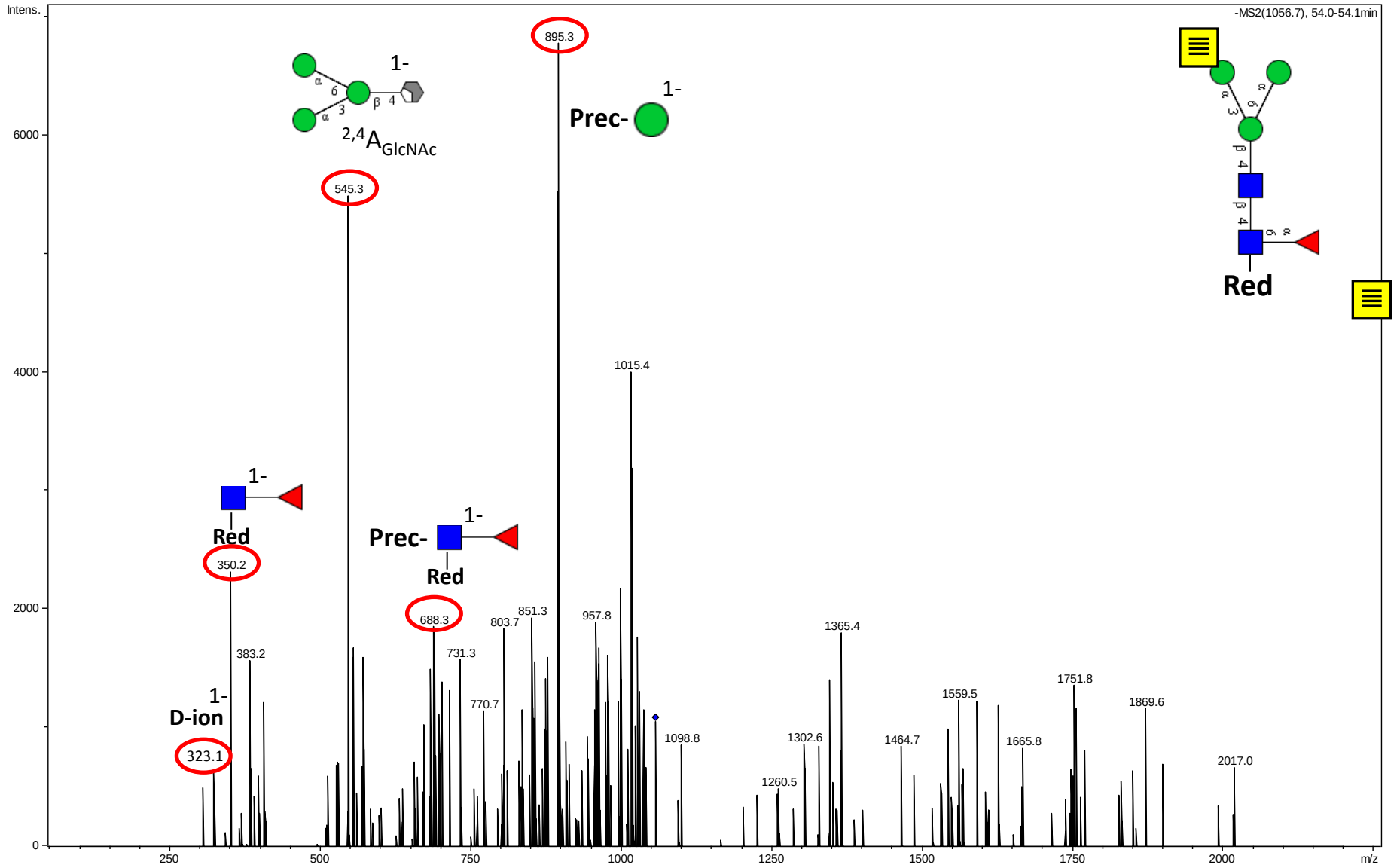
Supplementary Figure 1. Annotation of released N-glycan MS/MS identified from rat brain membrane associated proteins by PGC-LC-MS/MS (CID). Each spectra appear in the order presented in **Supplementary Table 1**.

Glycan #1

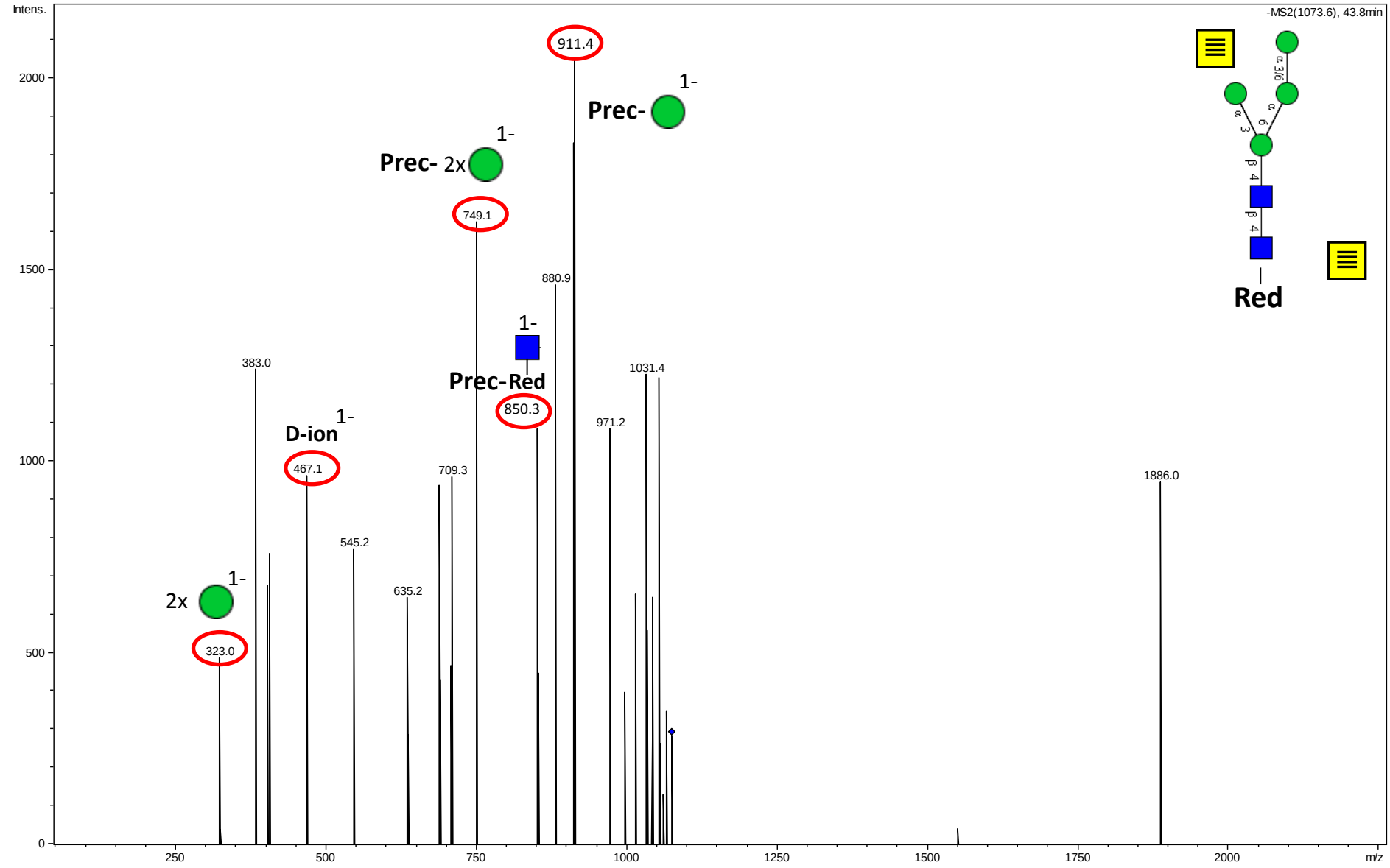
Precursor: m/z = 1057.4 (1-)
$(M-H)^-$ = 1057.4 Da
LC retention time: 53.9 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #2

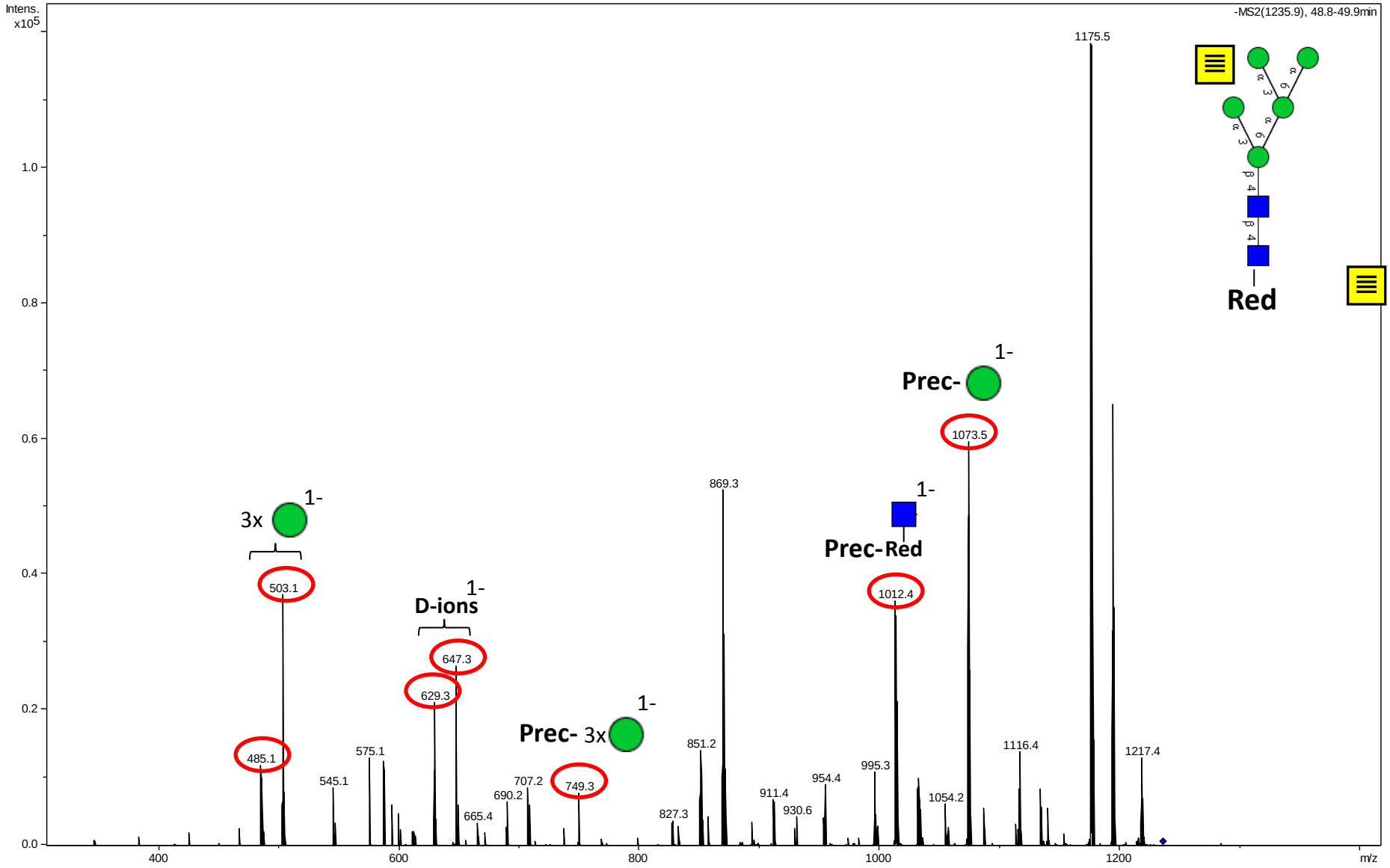
Precursor: m/z = 1073.4 (1-)
$(M-H)^-$ = 1073.4 Da
LC retention time: 43.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #3

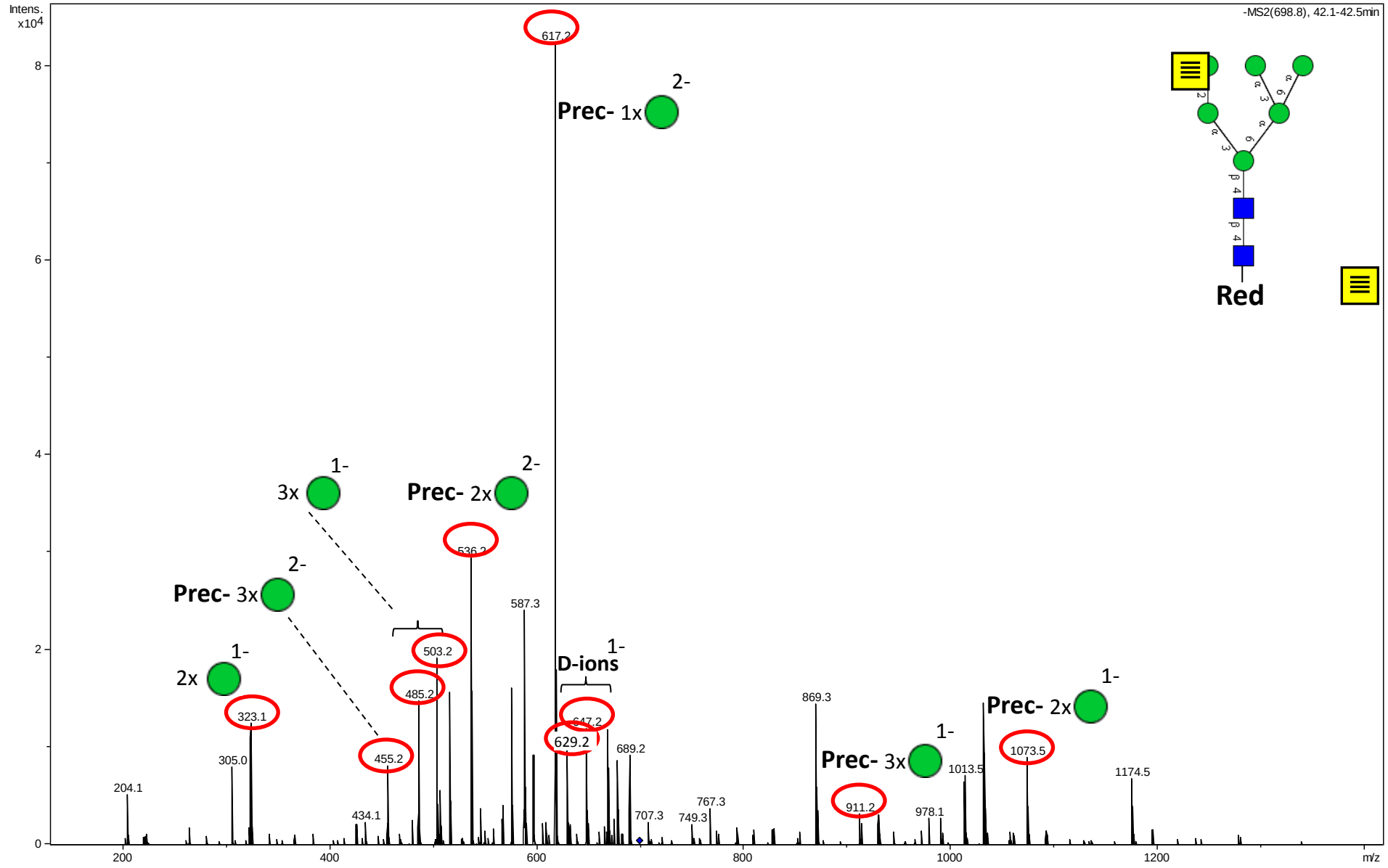
Precursor: m/z = 1235.5 (1-)
$(M-H)^-$ = 1235.5 Da
LC retention time: 48.7 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #4

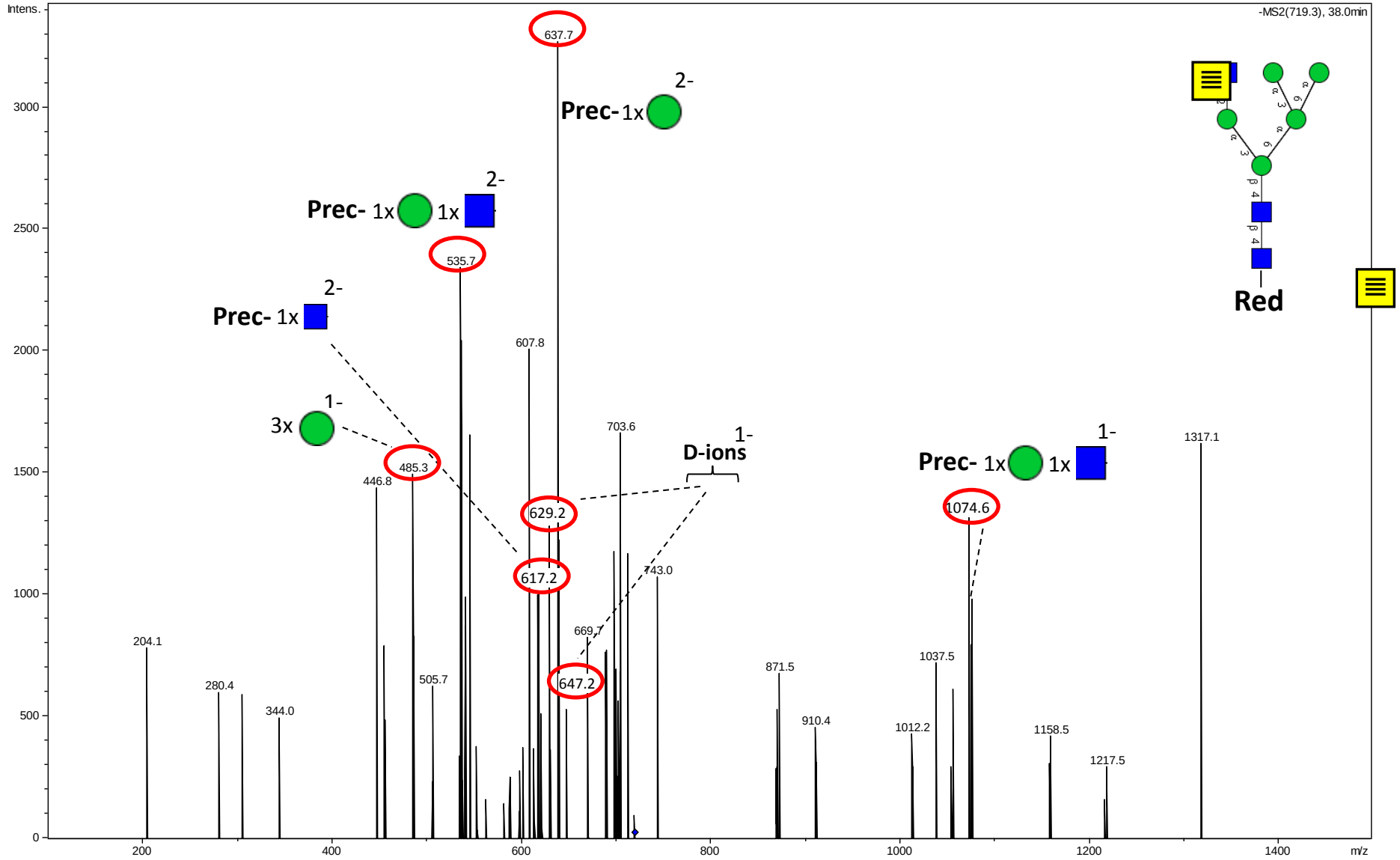
Precursor: m/z = 698.8 (2-)
$(M-H)^-$ = 1397.5 Da
LC retention time: 42.3 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #5

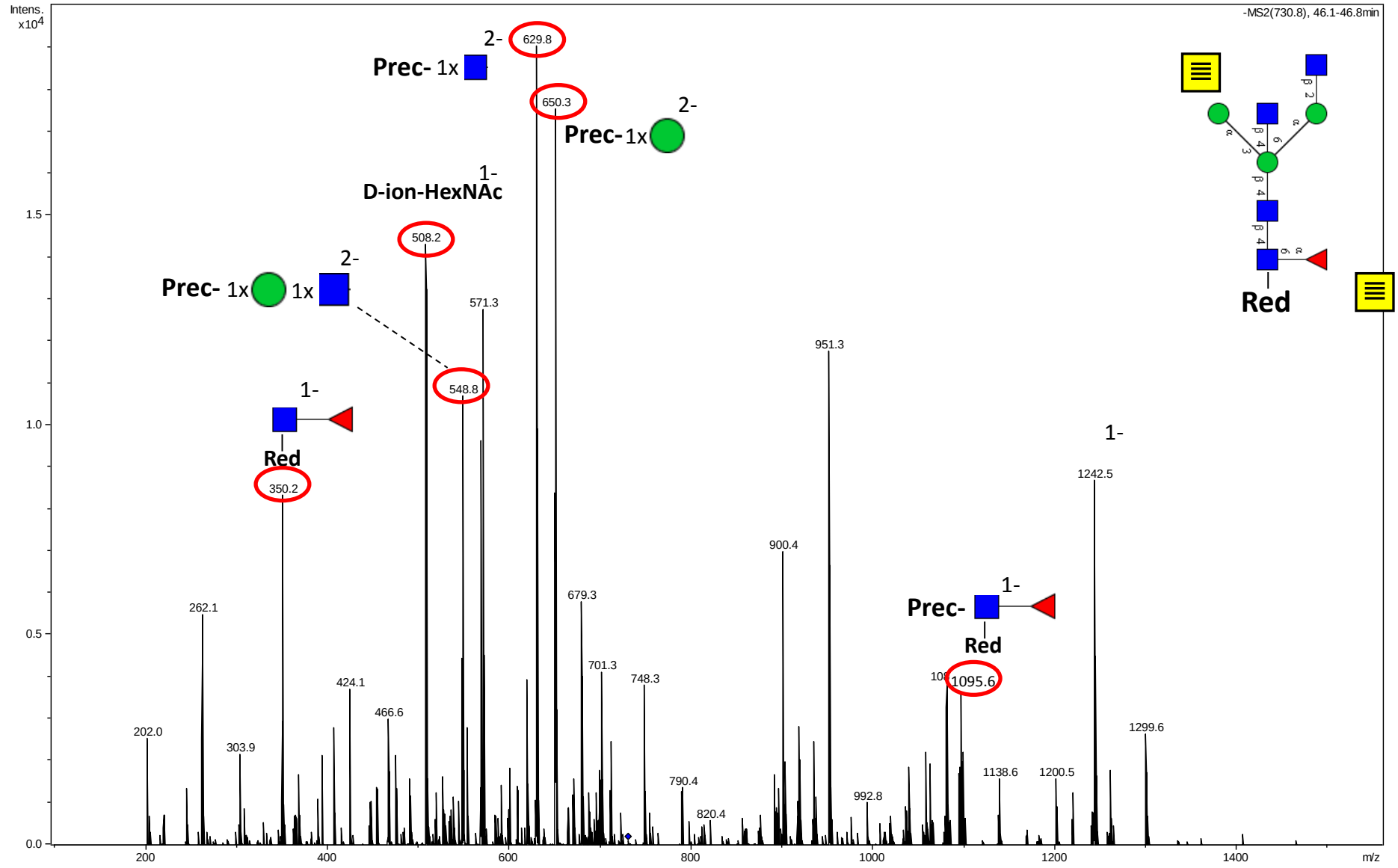
Precursor: m/z = 718.8 (2-)
$(M-H)^-$ = 1439.6 Da
LC retention time: 37.9 min



No match to MS2 spectrum in UniCarbKB

Glycan #6

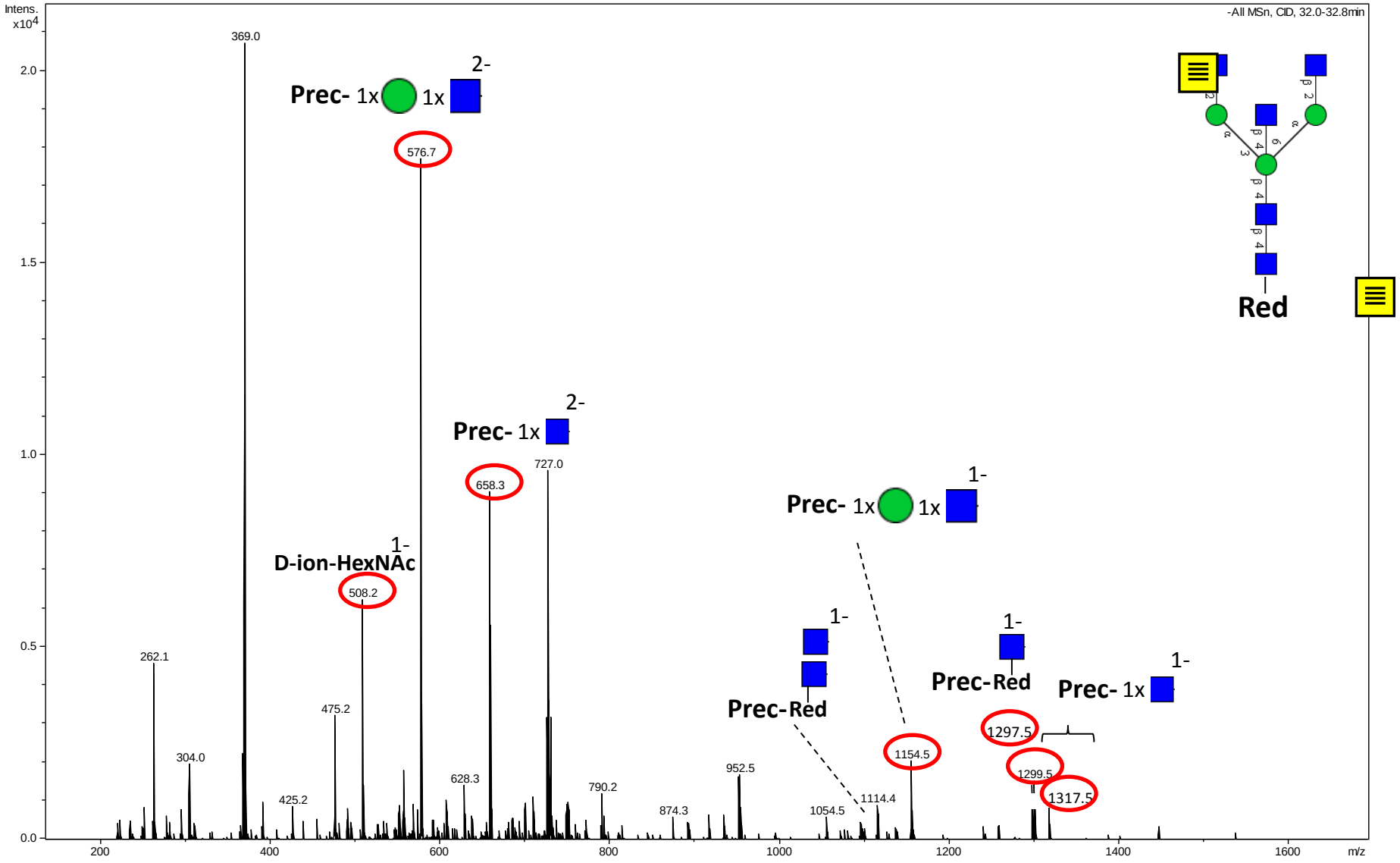
Precursor: m/z = 731.3 (2-)
$(M-H)^-$ = 1464.6 Da
LC retention time: 46.3 min



No match to MS2 spectrum in UniCarbKB

Glycan #7

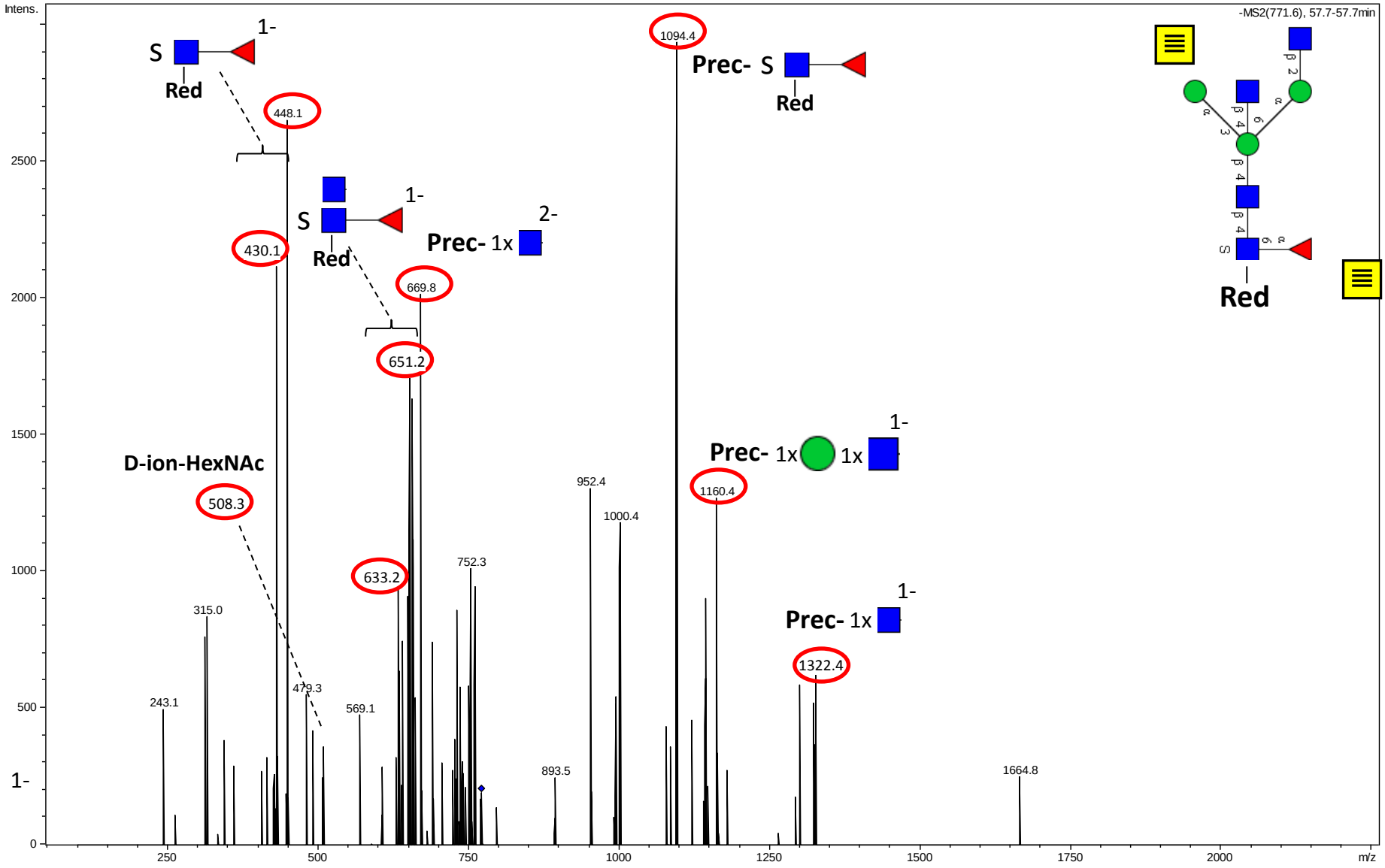
Precursor: m/z = 759.8 (2-)
$(M-H)^-$ = 1520.6 Da
LC retention time: 32.3 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #new 7A

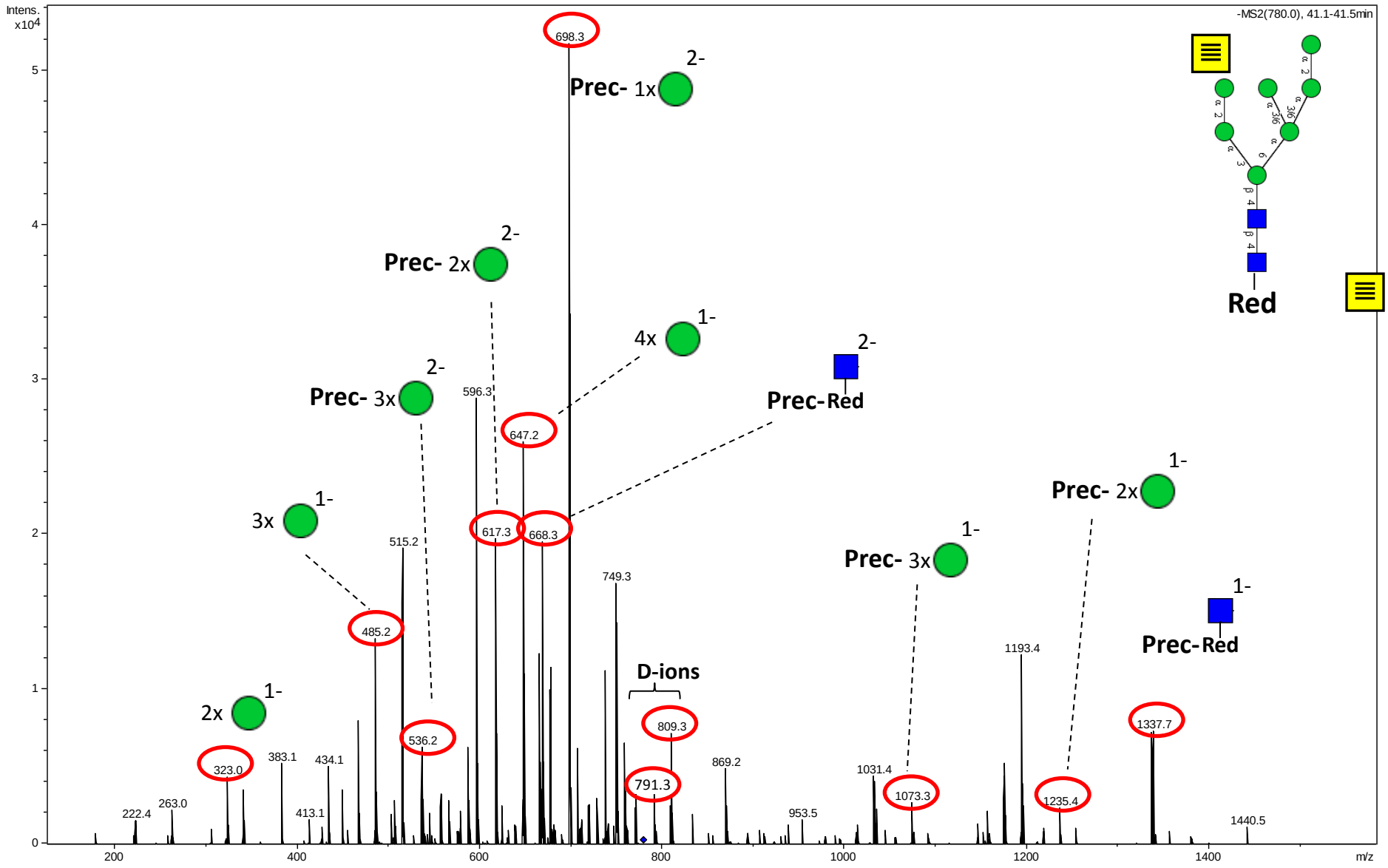
Precursor: m/z = 771.2 (2-)
$(M-H)^-$ = 1543.4 Da
LC retention time: 57.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #8A

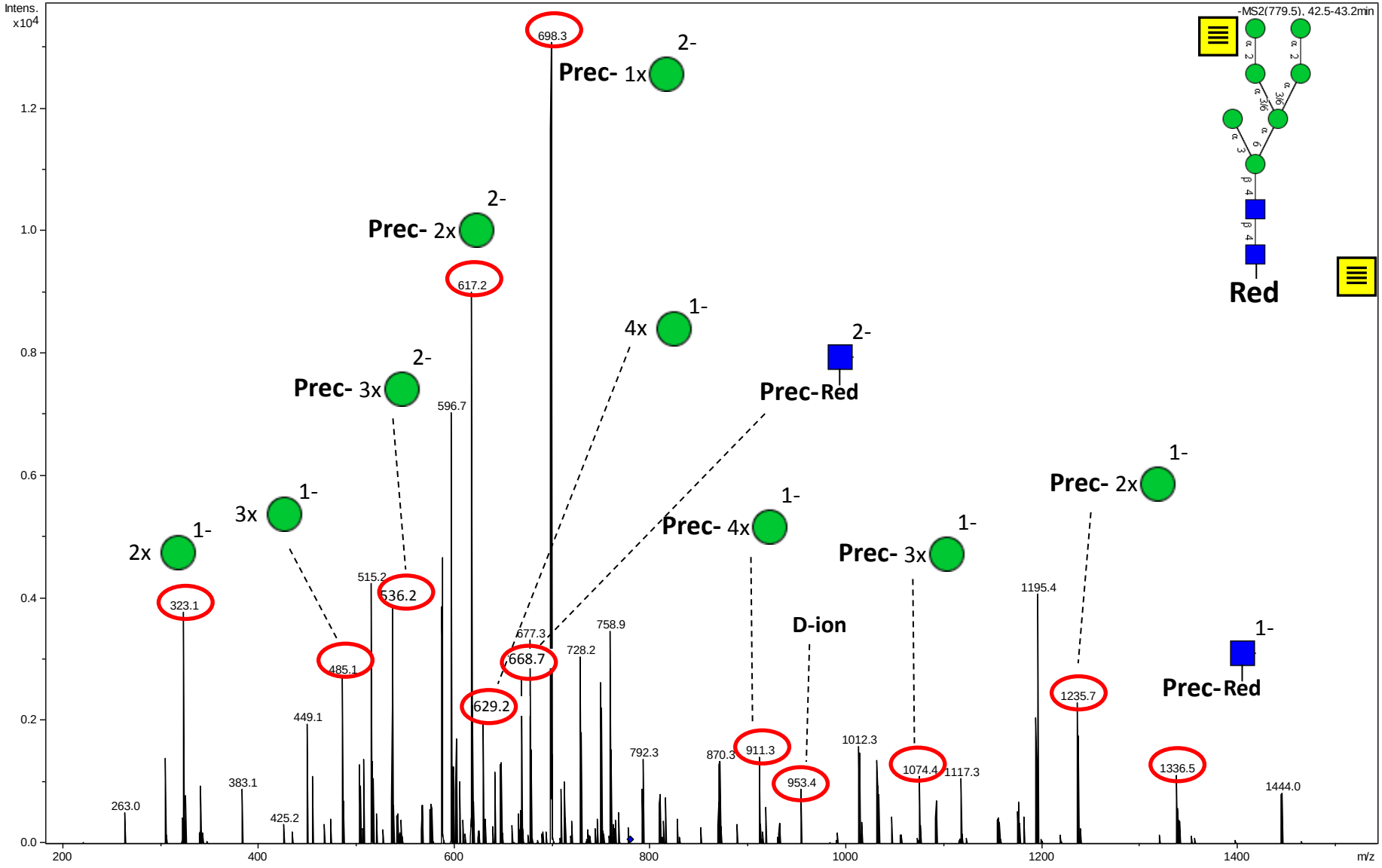
Precursor: m/z = 779.3 (2-)
$(M-H)^-$ = 1559.6 Da
LC retention time: 41.3 min



No match to MS2 spectrum in UniCarbKB

Glycan #8B

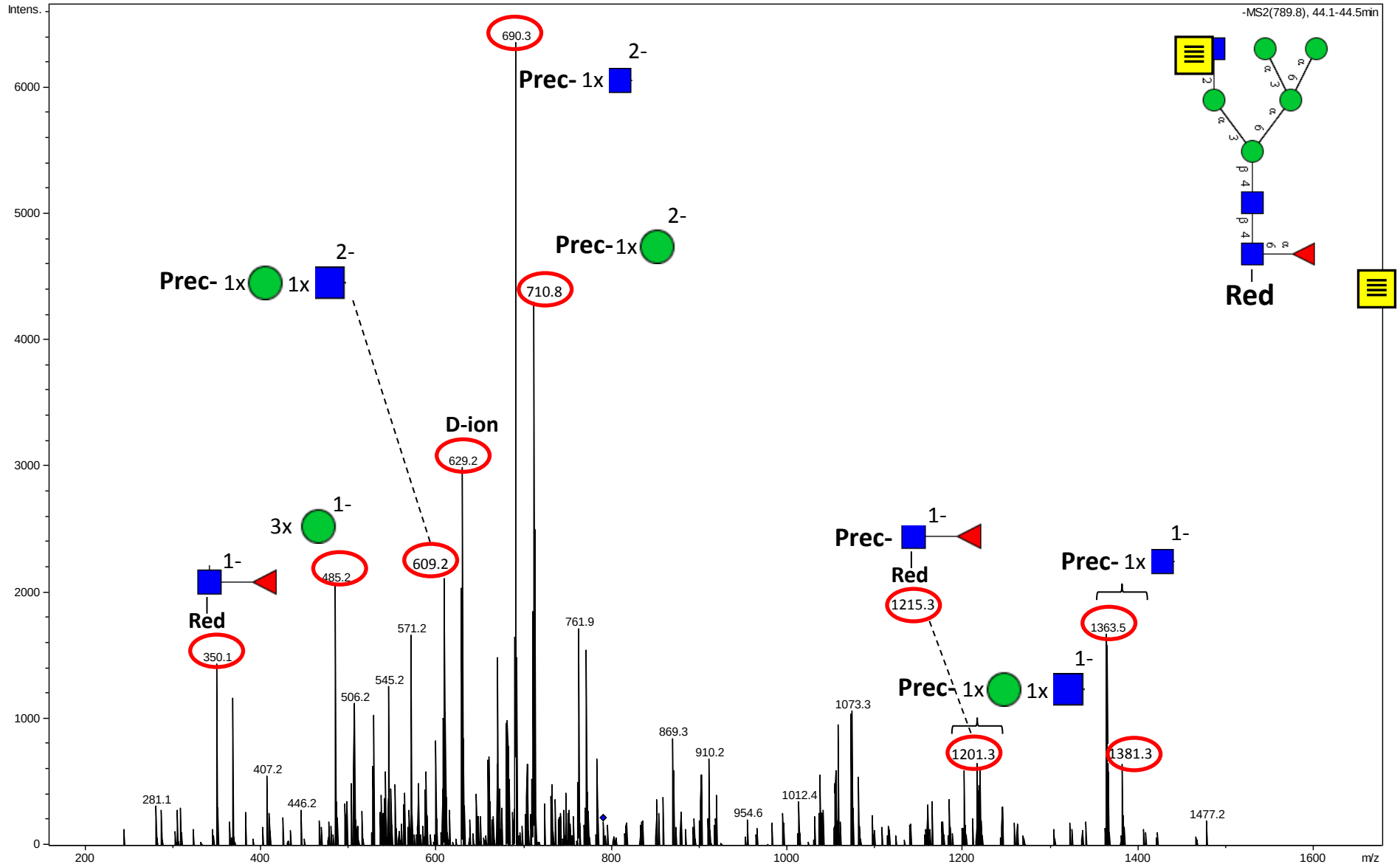
Precursor: m/z = 779.3 (2-)
$(M-H)^-$ = 1559.4 Da
LC retention time: 42.5 min



No match to MS2 spectrum in UniCarbKB

Glycan #9

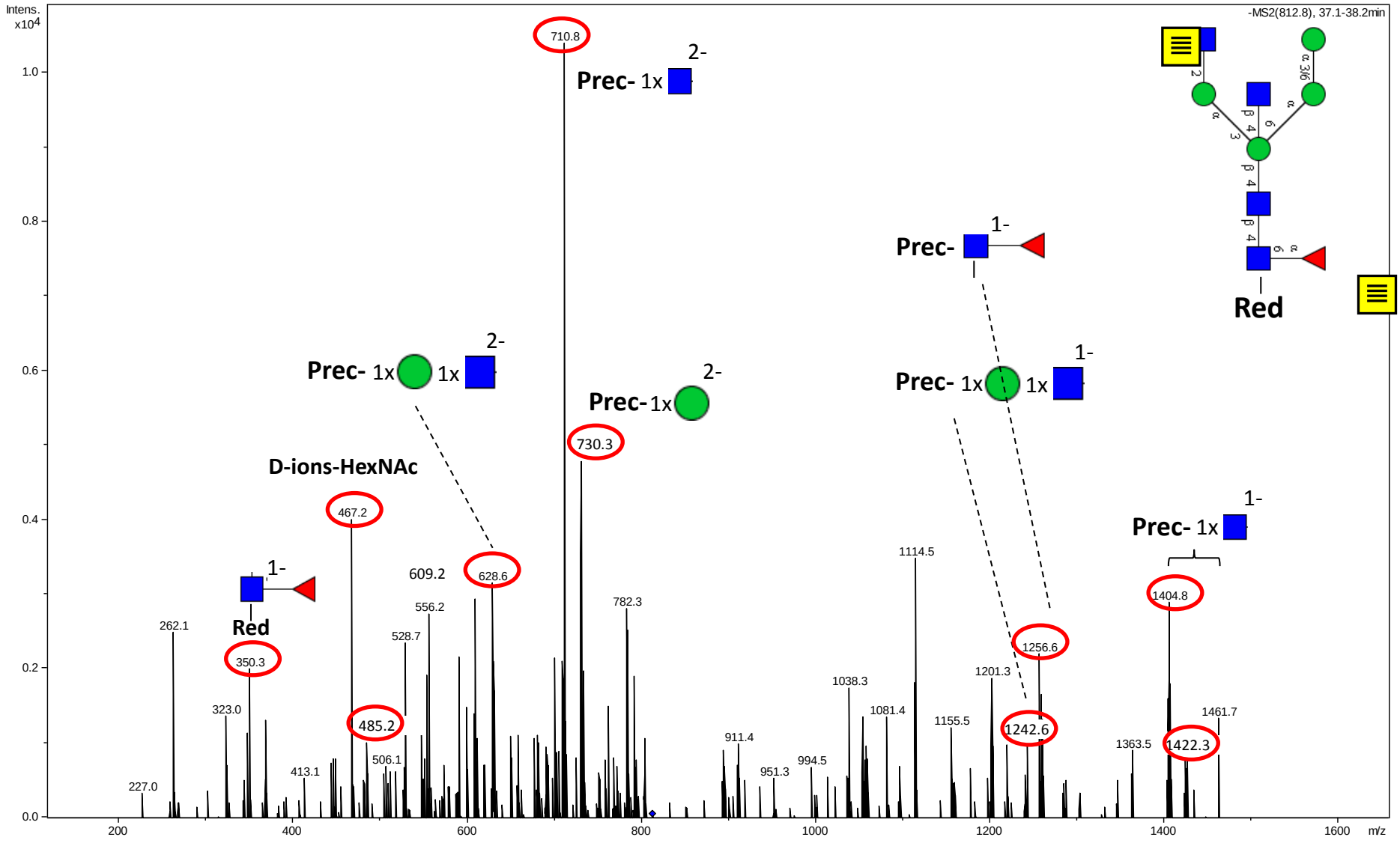
Precursor: m/z = 791.8 (2-)
$(M-H)^-$ = 1584.6 Da
LC retention time: 44.3 min



No match to MS2 spectrum in UniCarbKB

Glycan #11A

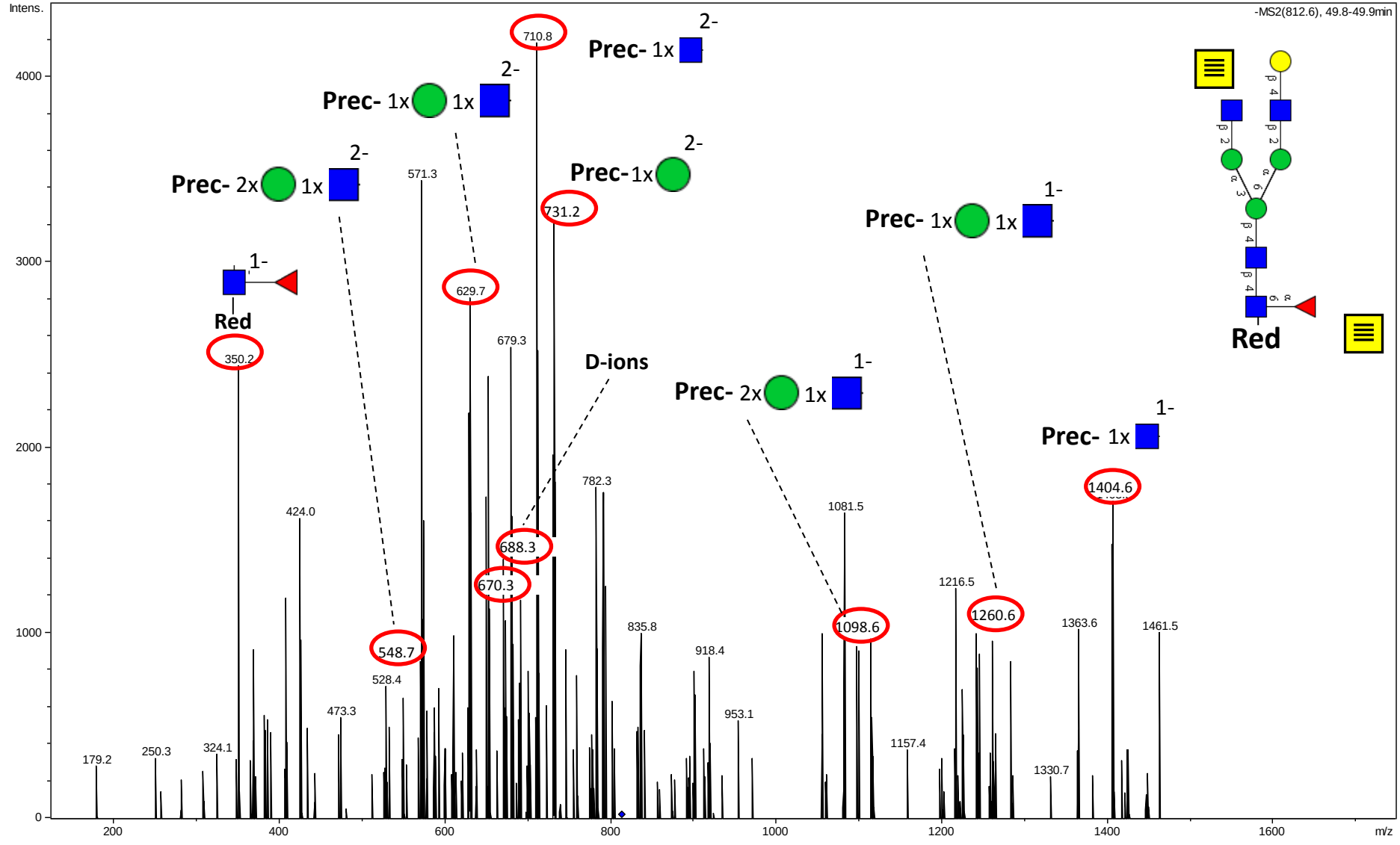
Precursor: m/z = 812.3 (2-)
$(M-H)^-$ = 1625.6 Da
LC retention time: 37.2 min



No match to MS2 spectrum in UniCarbKB

Glycan #11C

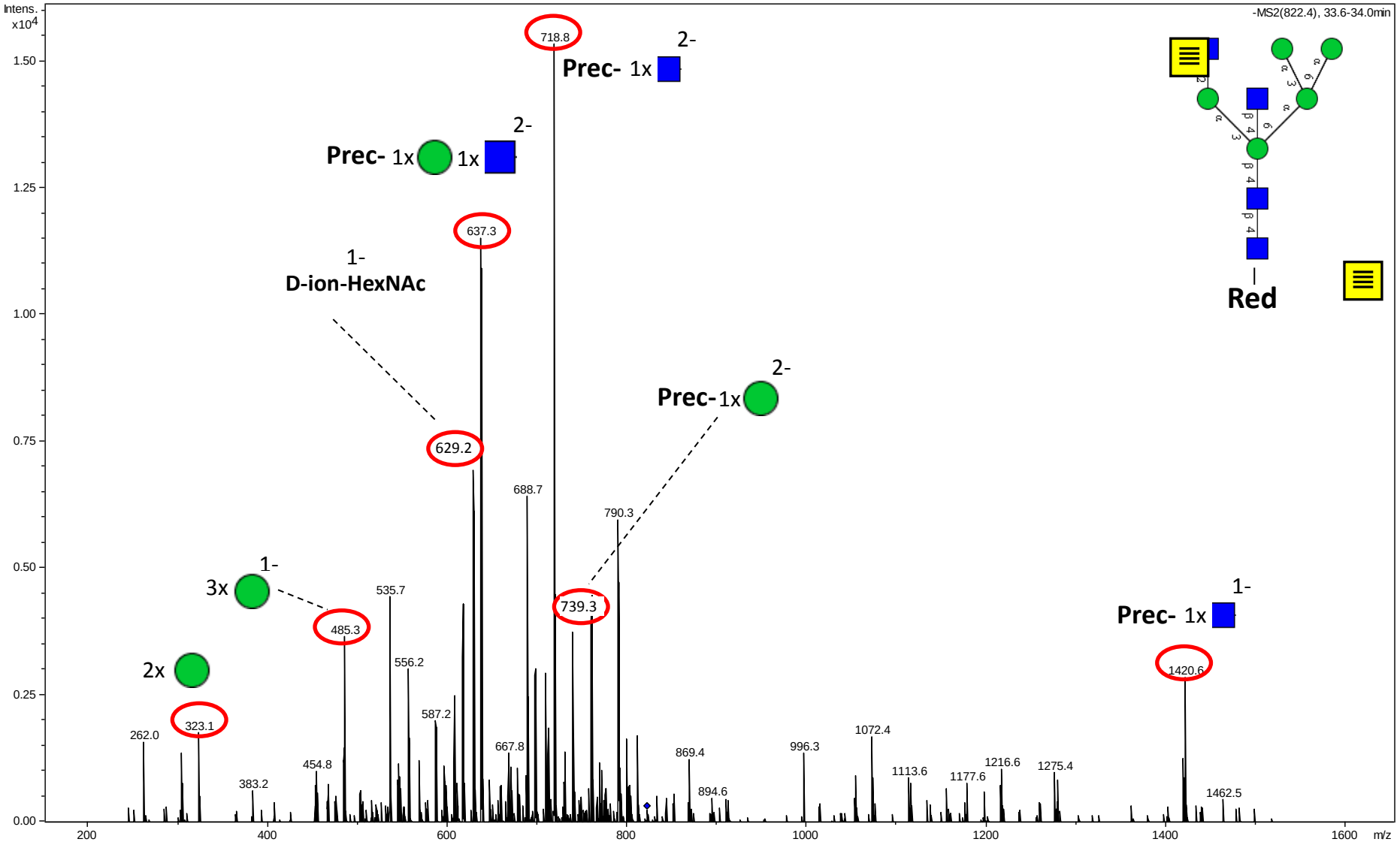
Precursor: m/z = 812.3 (2-)
$(M-H)^-$ = 1625.6 Da
LC retention time: 49.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #12

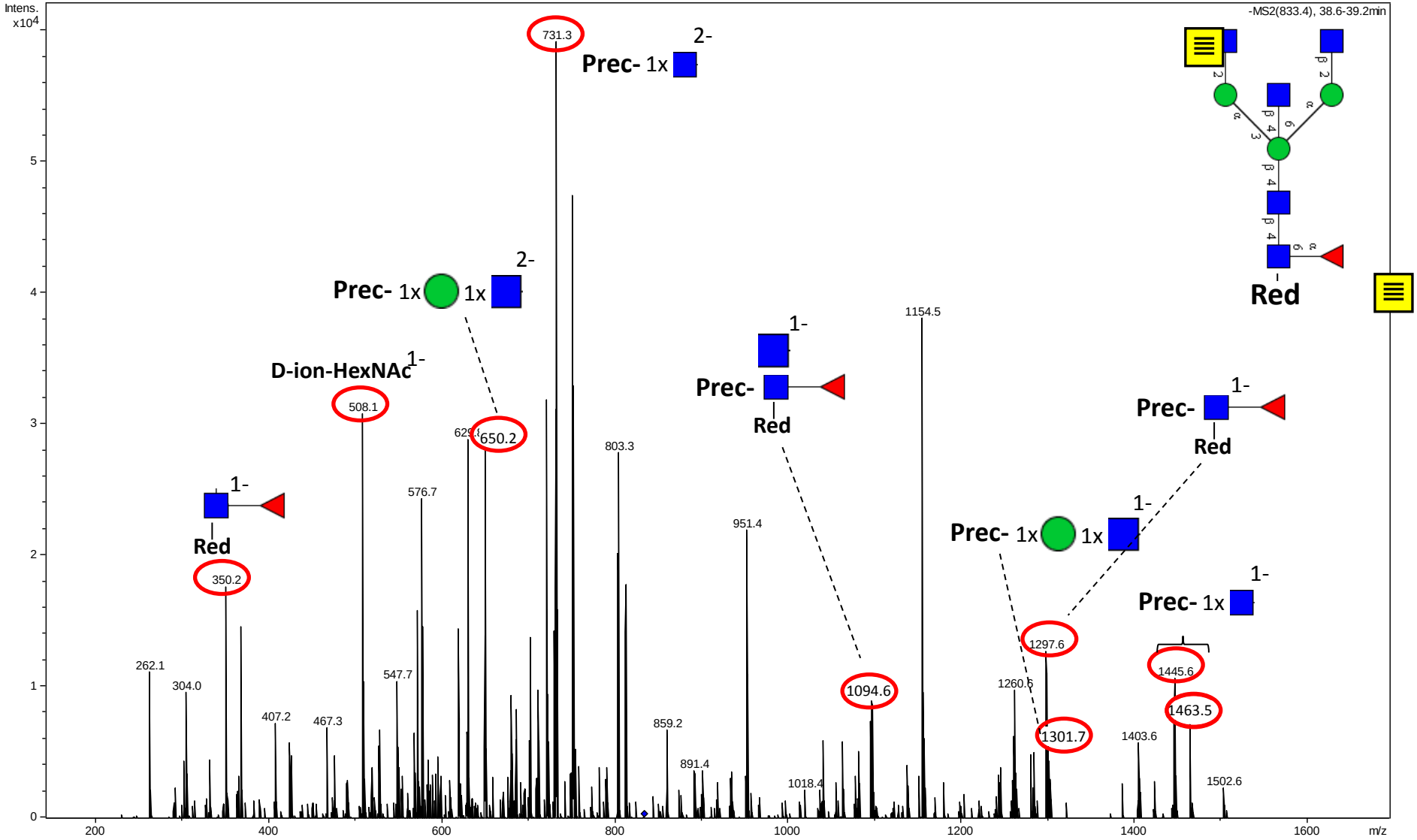
Precursor: m/z = 820.3 (2-)
$(M-H)^-$ = 1641.6 Da
LC retention time: 33.8 min



No match to MS2 spectrum in UniCarbKB

Glycan #13

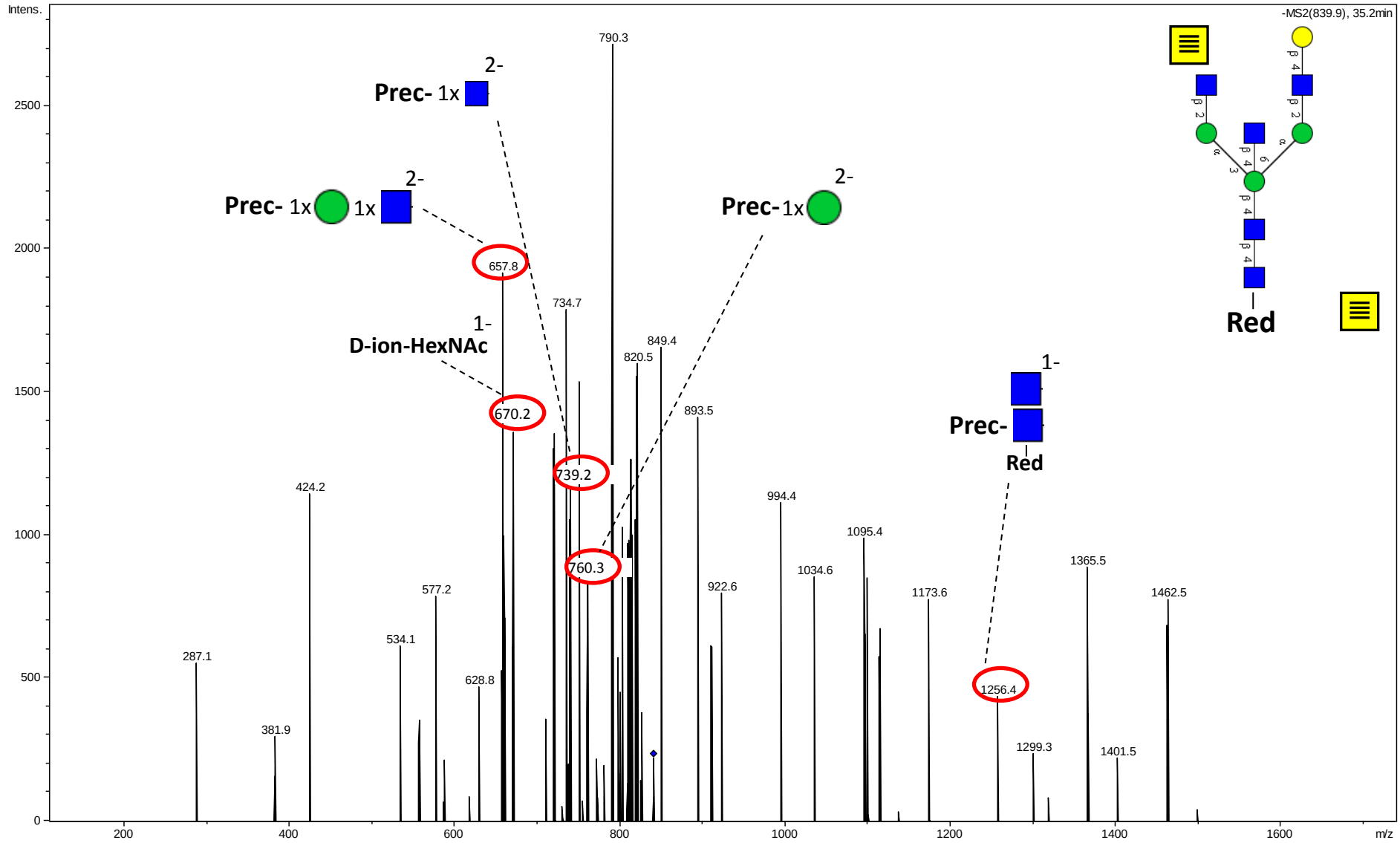
Precursor: m/z = 832.9 (2-)
$(M-H)^-$ = 1666.8 Da
LC retention time: 38.8 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #14

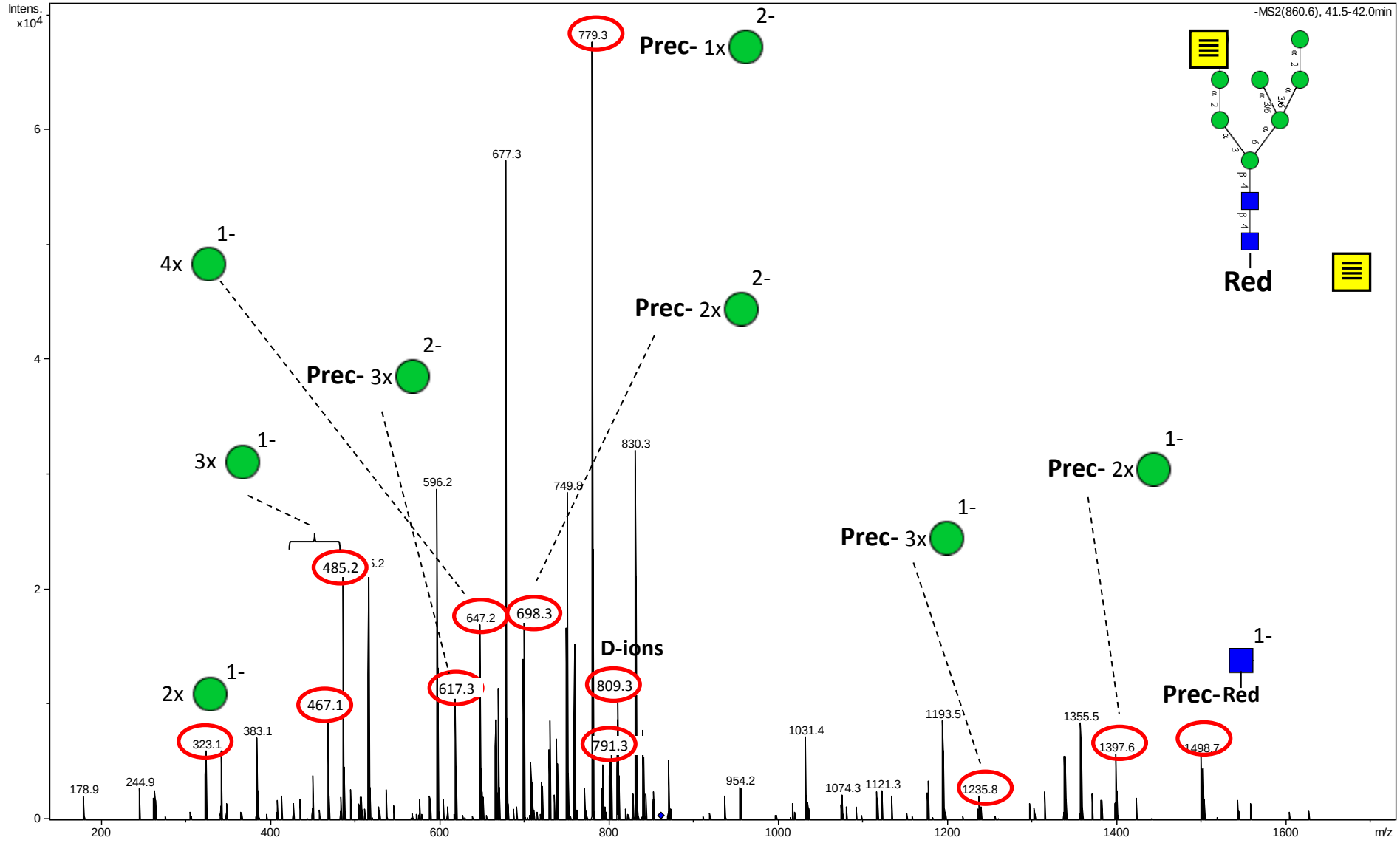
Precursor: m/z = 840.8 (2-)
$(M-H)^-$ = 1682.6 Da
LC retention time: 35.2 min



No match to MS2 spectrum in UniCarbKB

Glycan #16

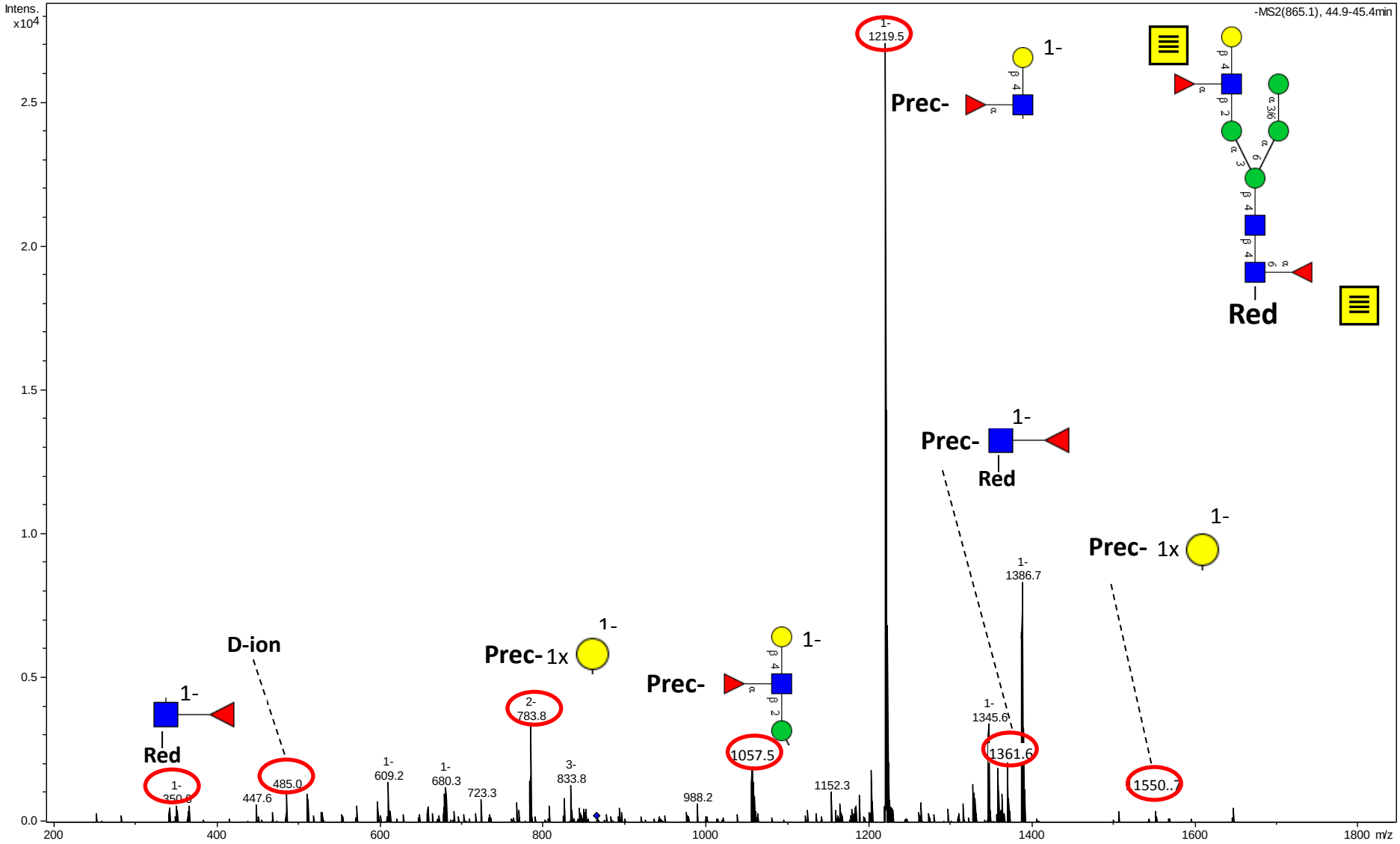
Precursor: m/z = 860.3 (2-)
$(M-H)^-$ = 1721.6 Da
LC retention time: 41.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #17

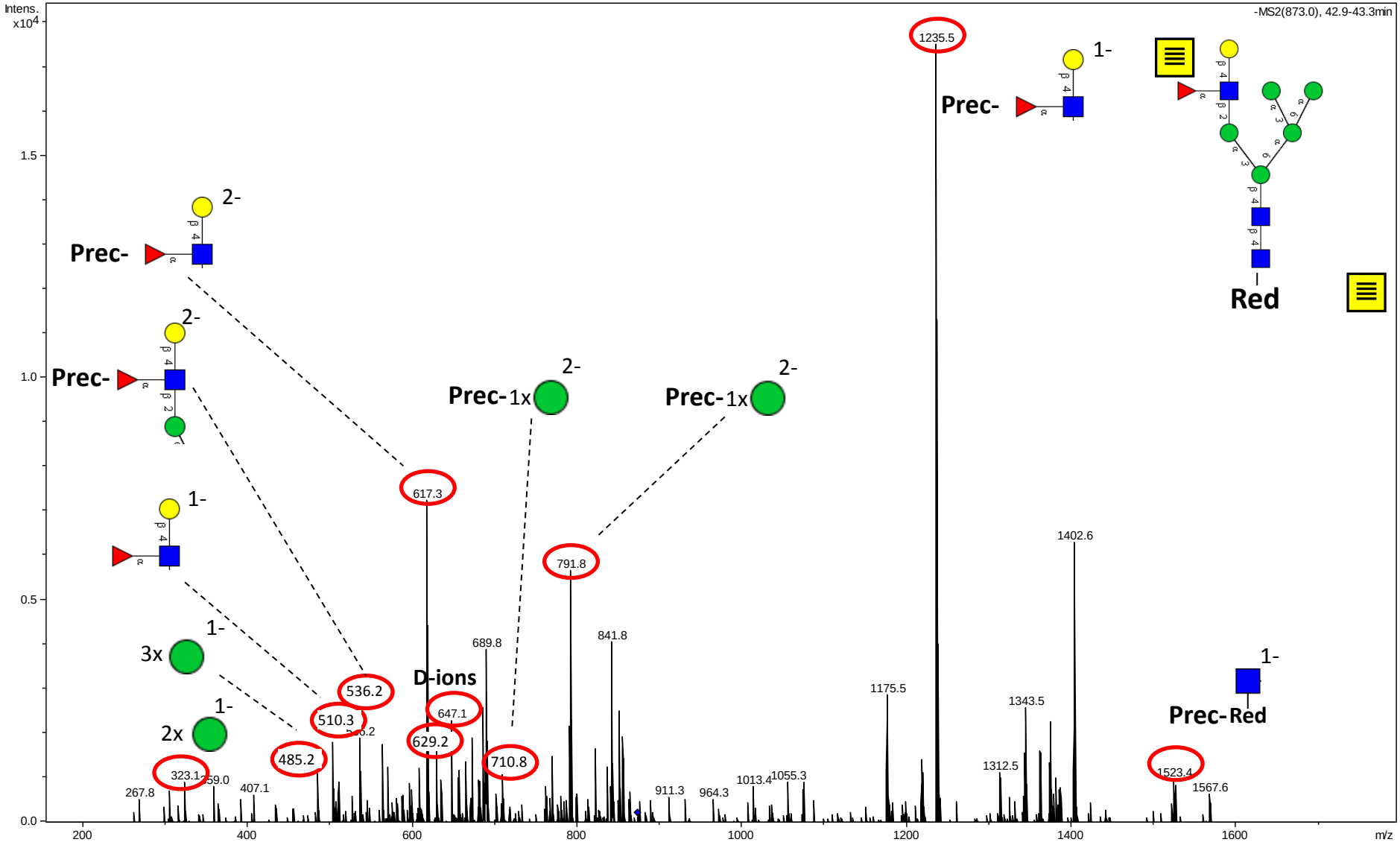
Precursor: m/z = 864.8 (2-)
$(M-H)^-$ = 1730.6 Da
LC retention time: 45.1 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #18A

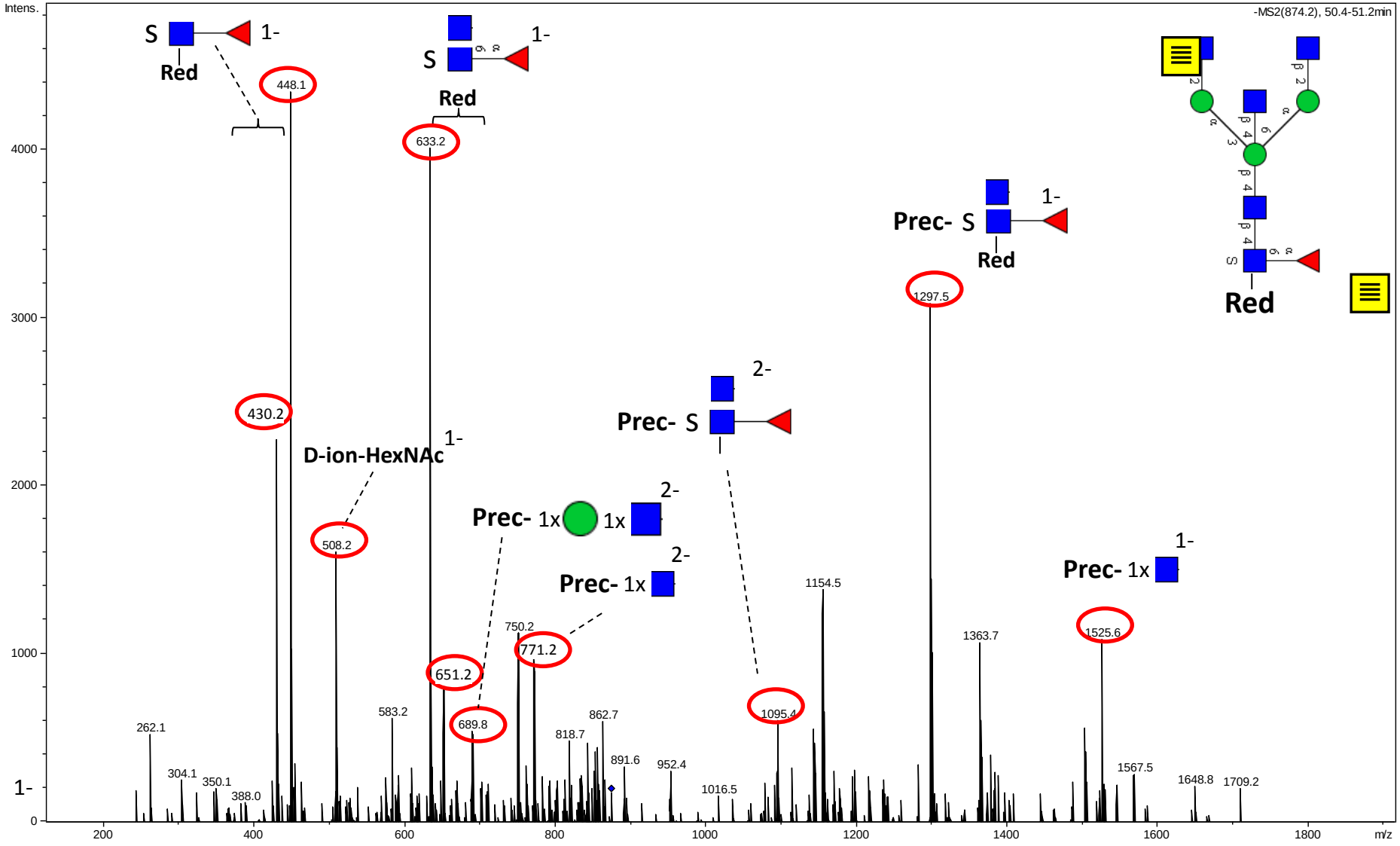
Precursor: m/z = 872.8 (2-)
$(M-H)^-$ = 1746.6 Da
LC retention time: 43.0 min



No match to MS2 spectrum in UniCarbKB

Glycan #18B

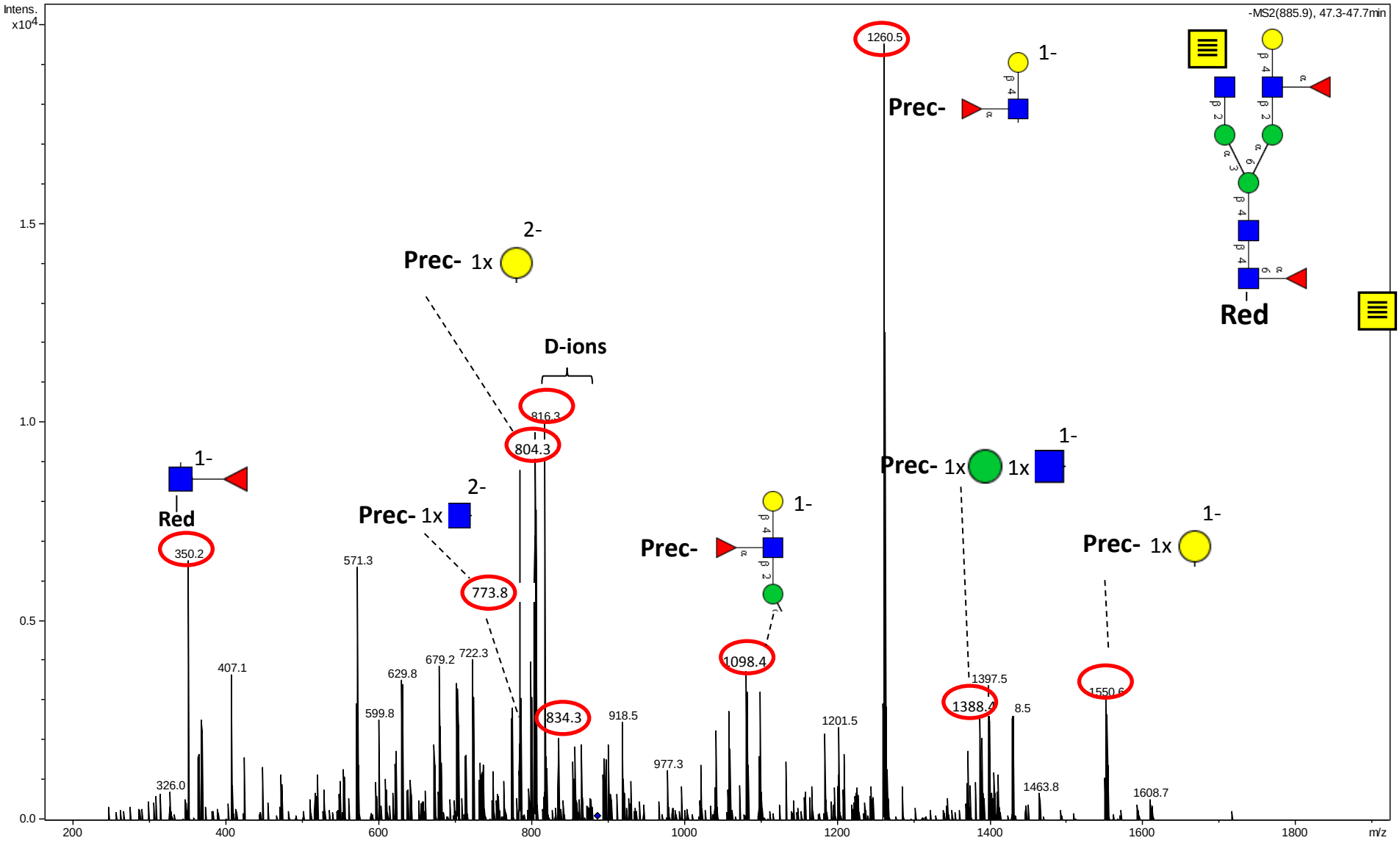
Precursor: m/z = 872.8 (2-)
$(M-H)^-$ = 1746.6 Da
LC retention time: 50.6 min



No match to MS2 spectrum in UniCarbKB

Glycan #19A

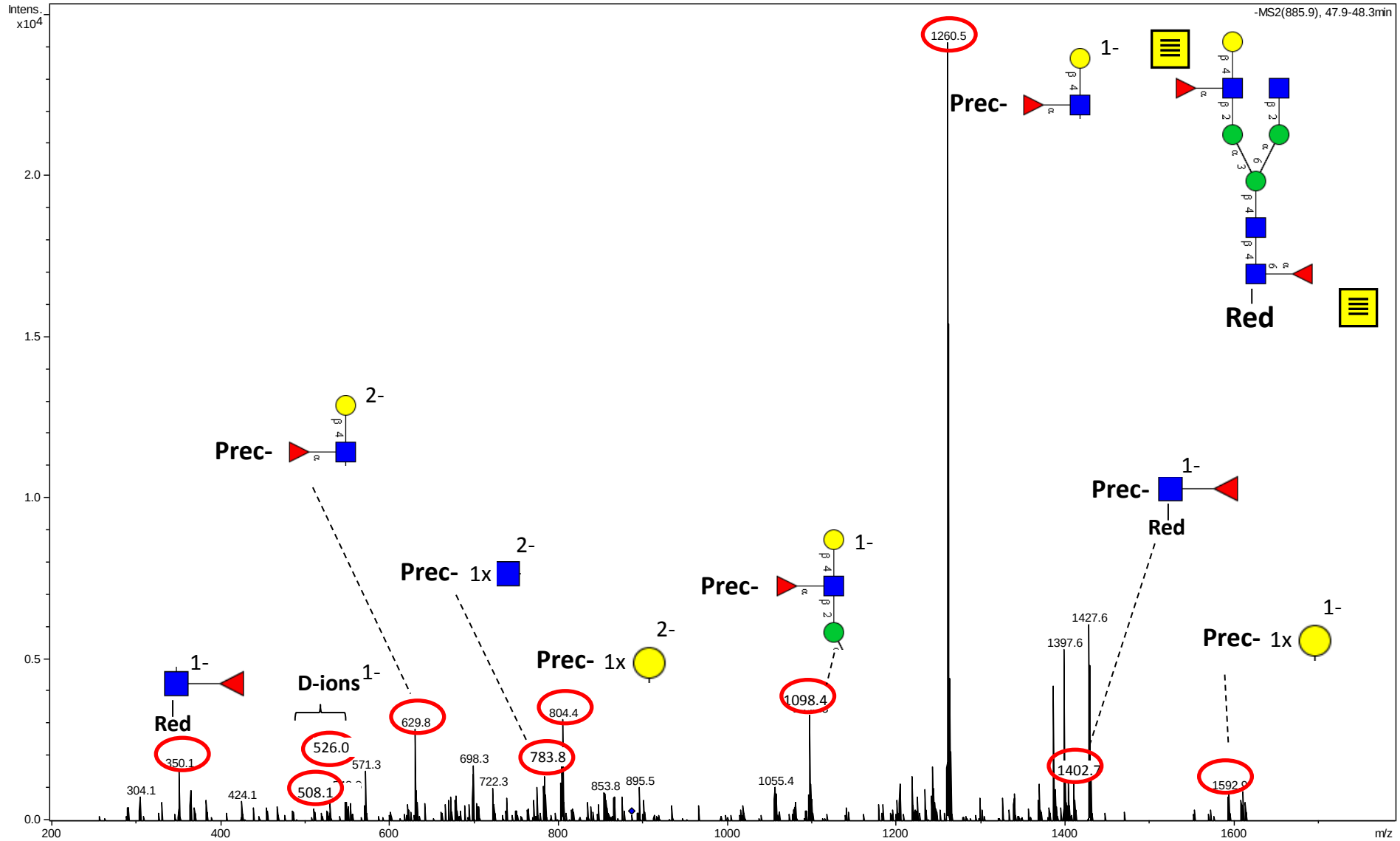
Precursor: m/z = 885.4 (2-)
$(M-H)^-$ = 1771.8 Da
LC retention time: 47.5 min



No match to MS2 spectrum in UniCarbKB

Glycan #19B

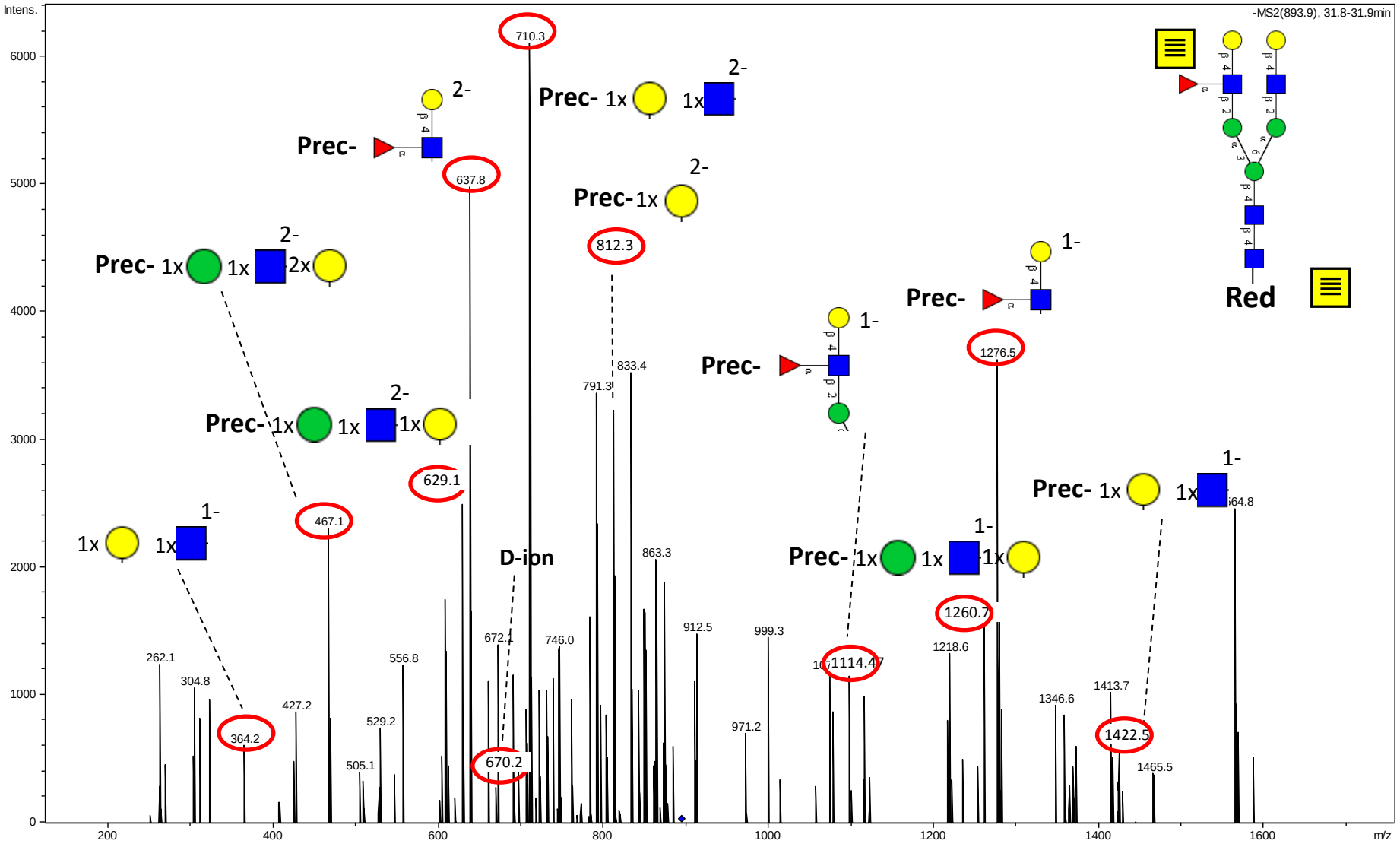
Precursor: m/z = 885.4 (2-)
$(M-H)^-$ = 1771.8 Da
LC retention time: 48.0 min



No match to MS2 spectrum in UniCarbKB

Glycan #20A

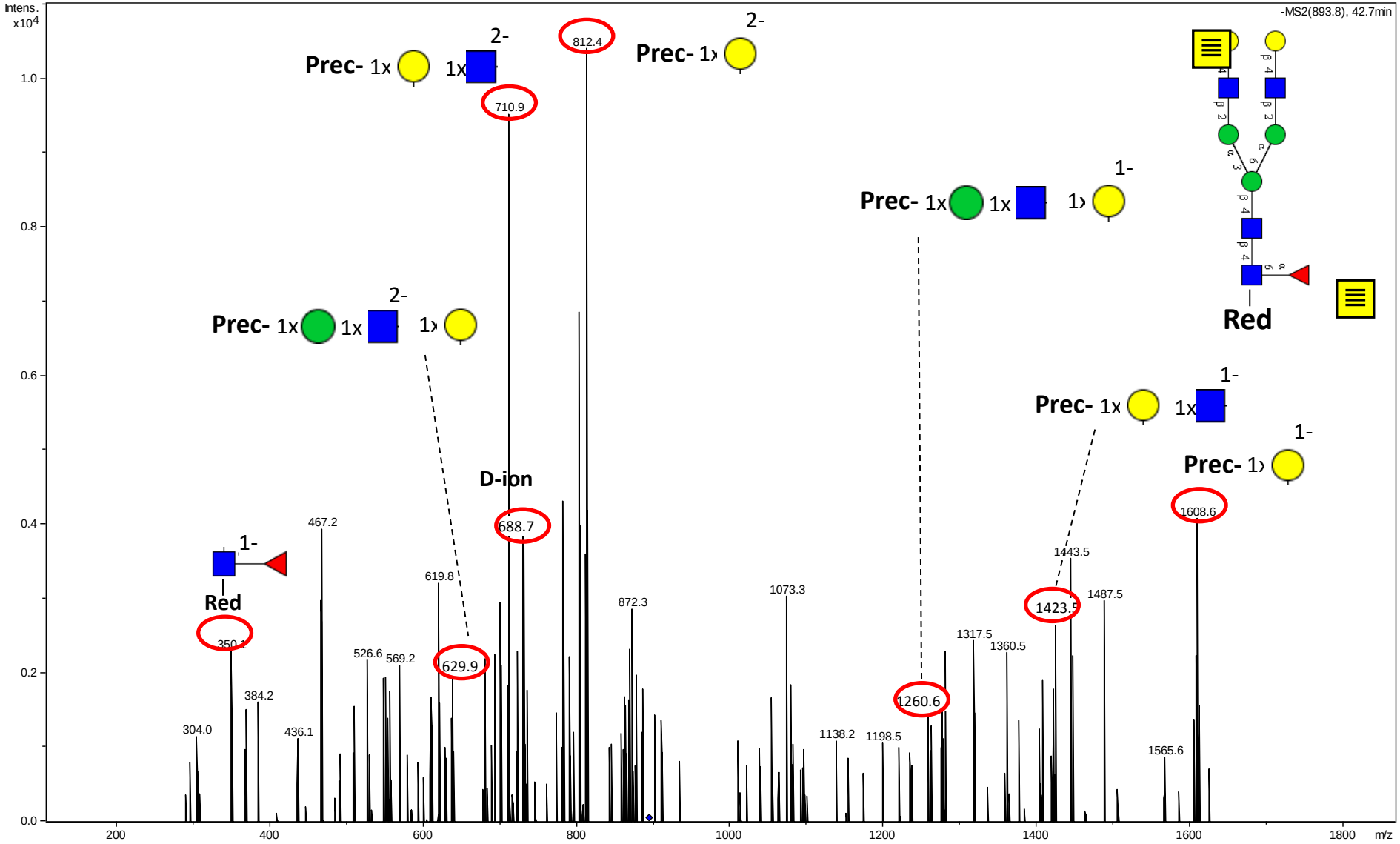
Precursor: m/z = 893.4 (2-)
$(M-H)^-$ = 1787.8 Da
LC retention time: 31.8 min



No match to MS2 spectrum in UniCarbKB

Glycan #20C

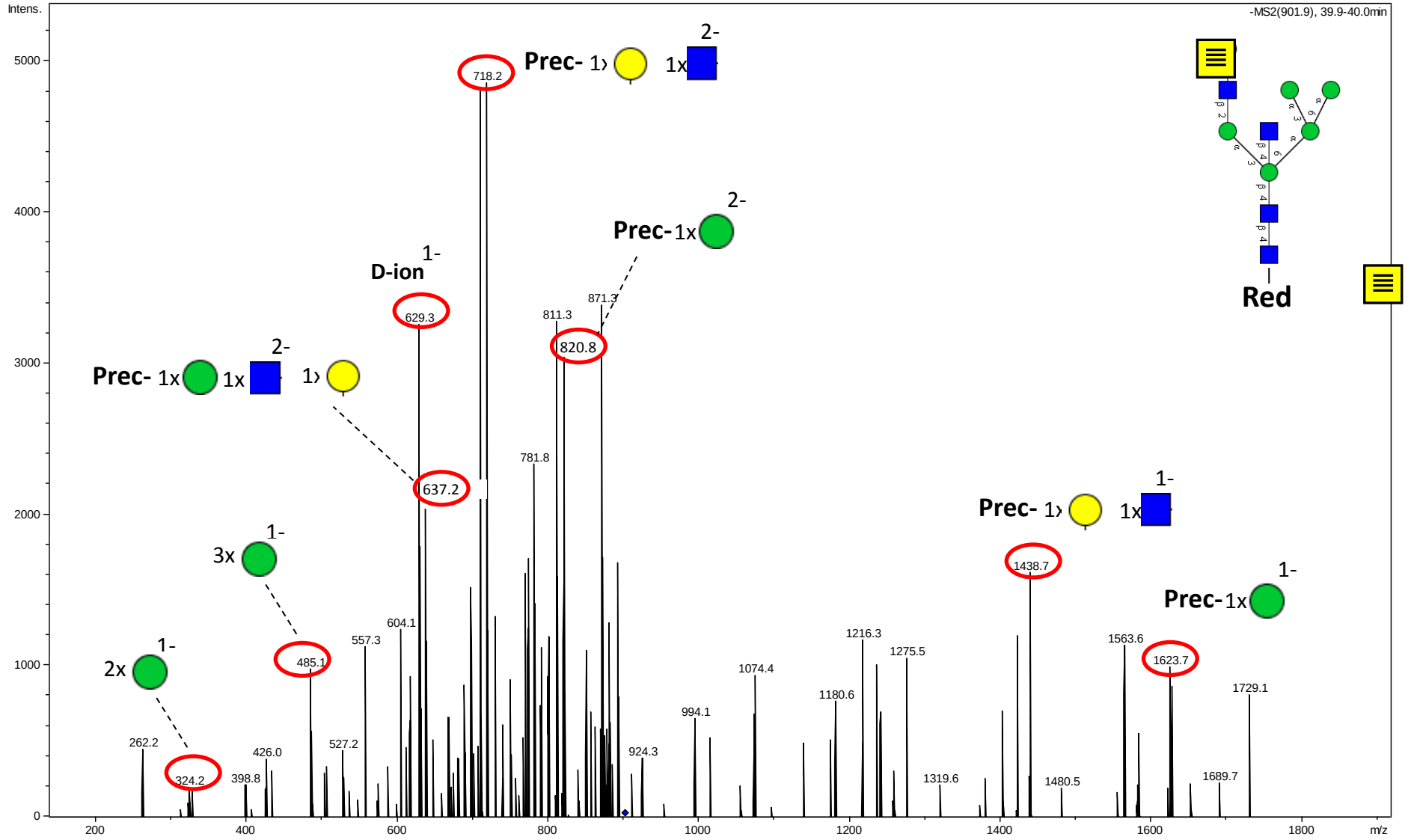
Precursor: m/z = 893.4 (2-)
$(M-H)^-$ = 1787.8 Da
LC retention time: 42.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #21

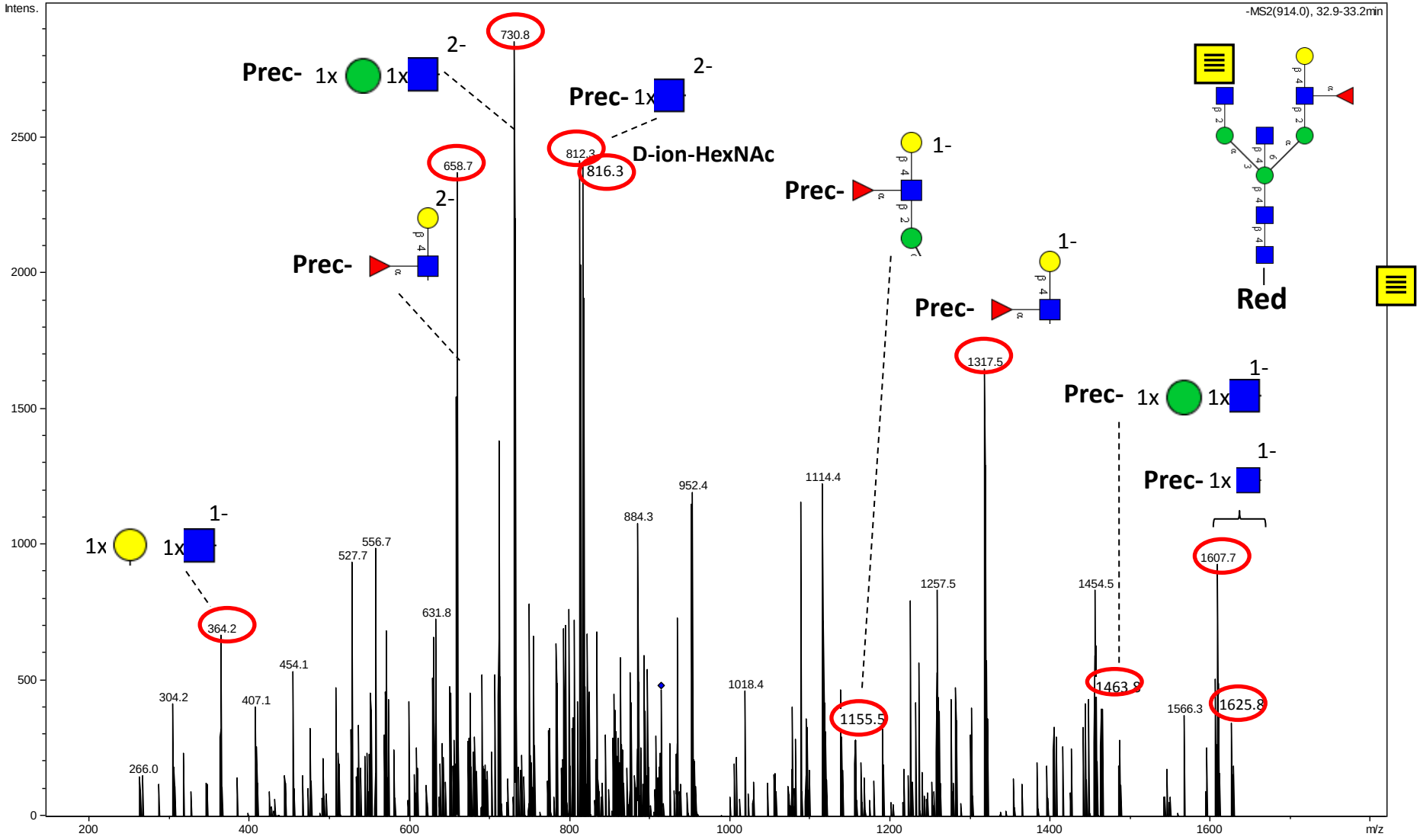
Precursor: m/z = 901.4 (2-)
$(M-H)^-$ = 1803.8 Da
LC retention time: 40.0 min



No match to MS2 spectrum in UniCarbKB

Glycan #22A

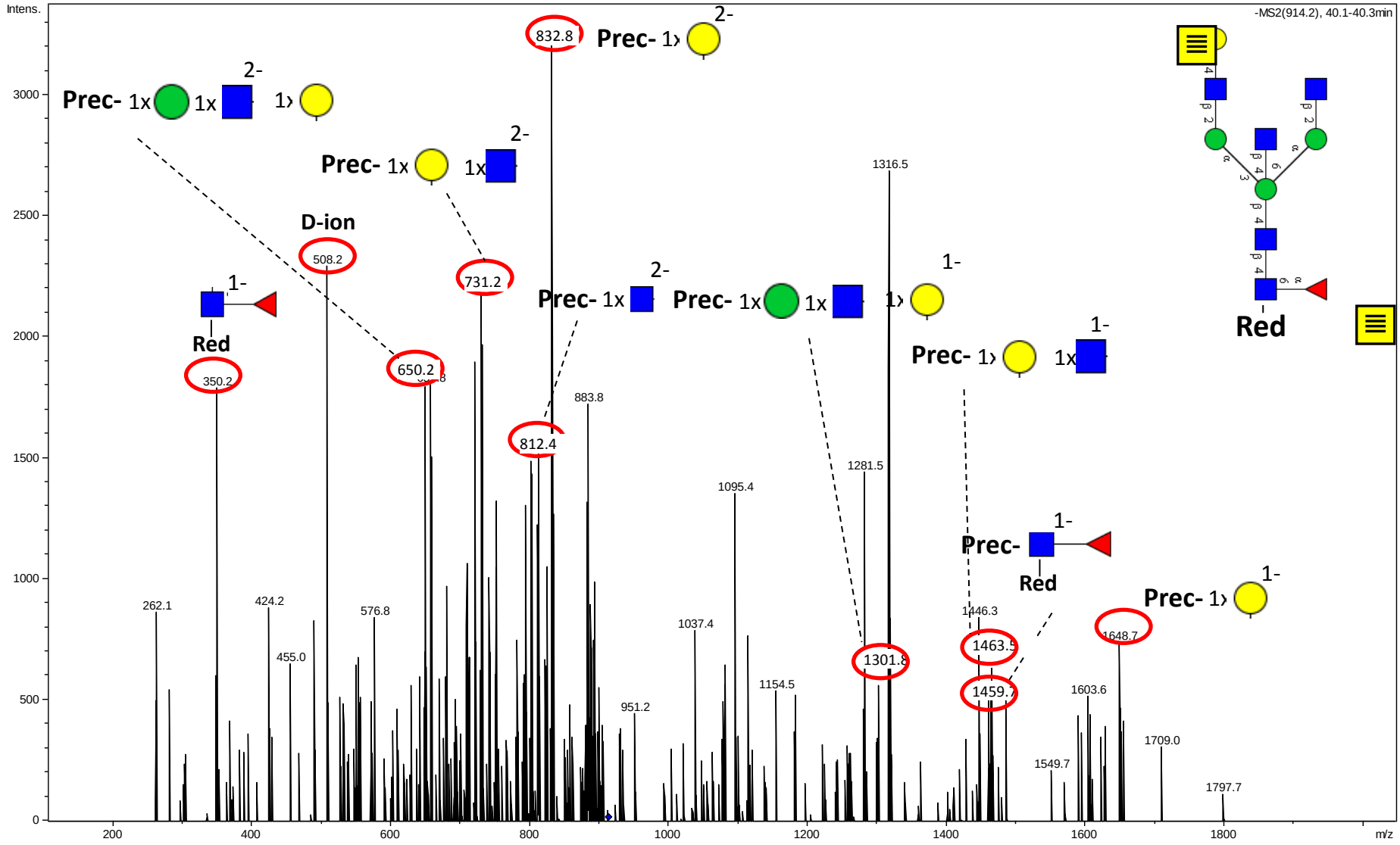
Precursor: m/z = 913.9 (2-)
$(M-H)^-$ = 1828.8 Da
LC retention time: 32.8 min



No match to MS2 spectrum in UniCarbKB

Glycan #22B

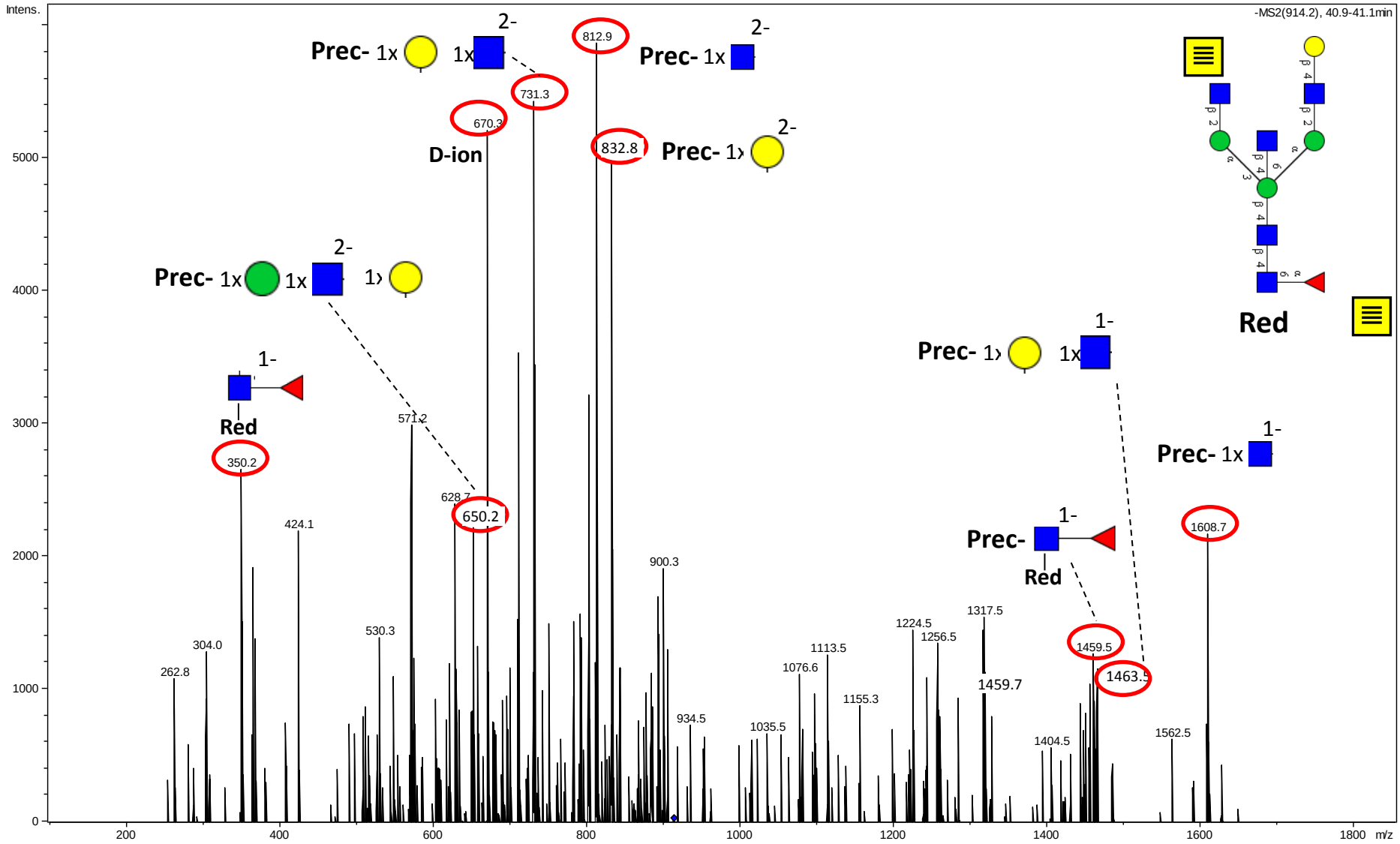
Precursor: m/z = 913.9 (2-)
$(M-H)^-$ = 1828.8 Da
LC retention time: 40.3 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #22C

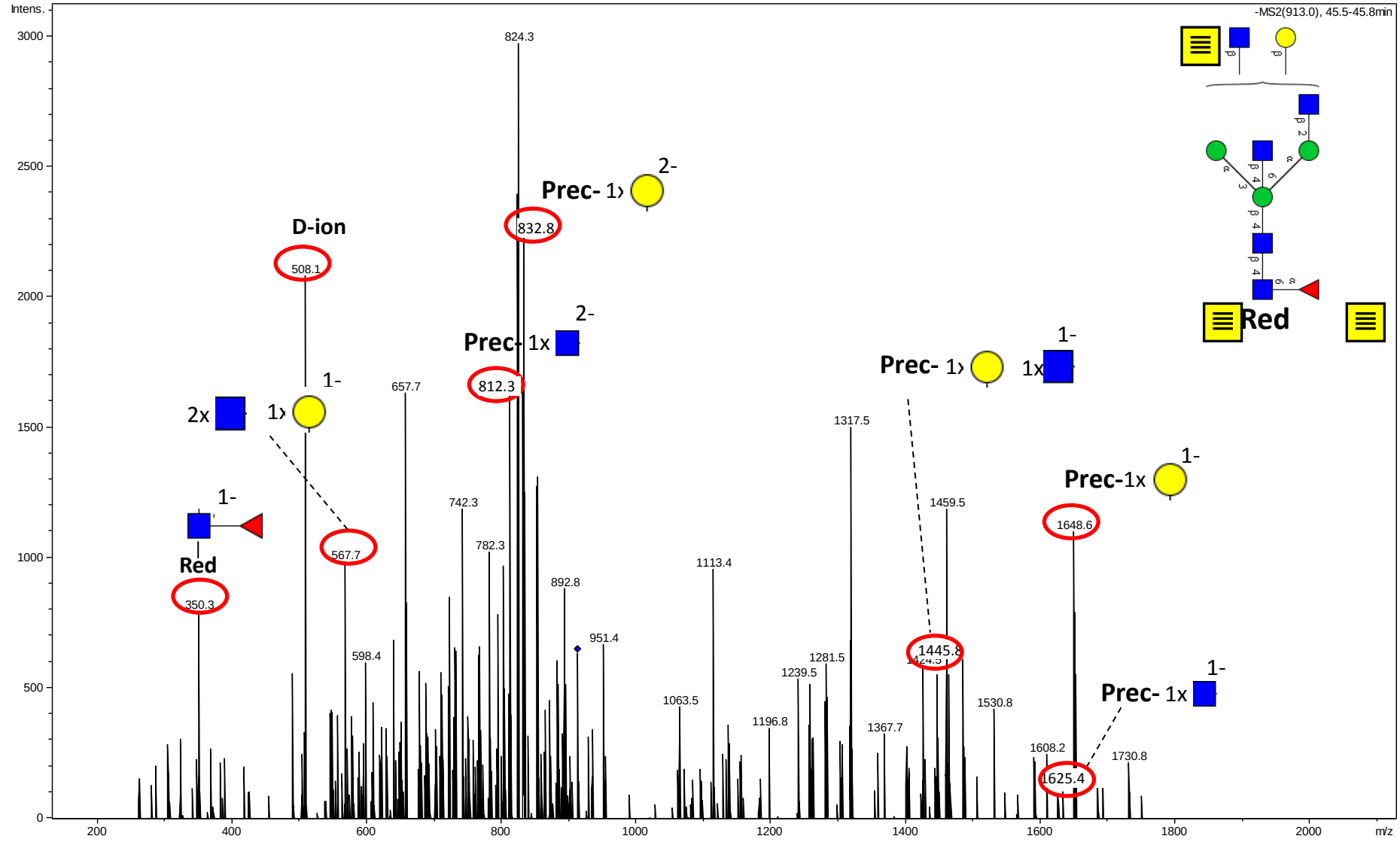
Precursor: m/z = 913.9 (2-)
$(M-H)^-$ = 1828.8 Da
LC retention time: 41.1 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #22D

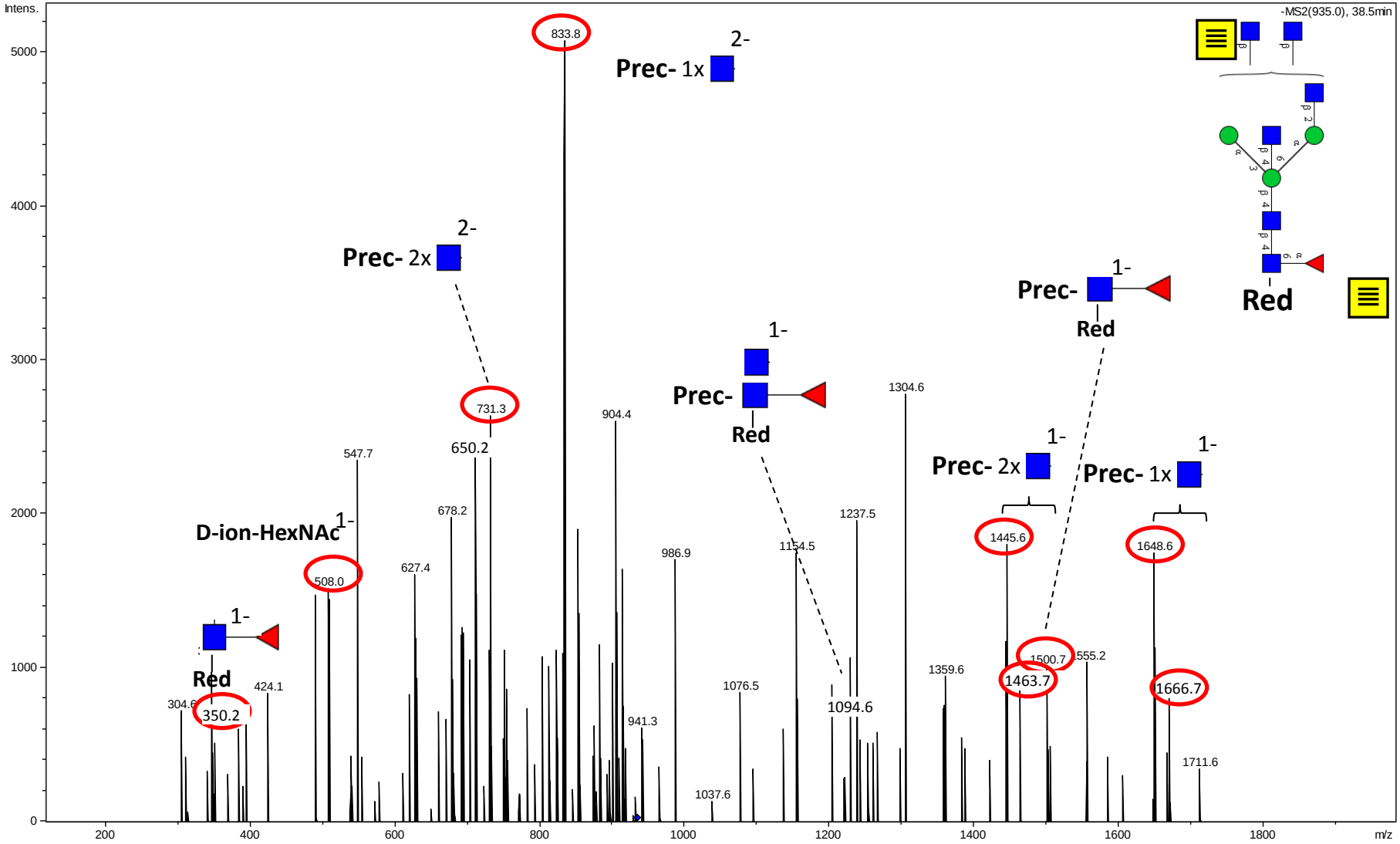
Precursor: m/z = 913.9 (2-)
$(M-H)^-$ = 1828.8 Da
LC retention time: 41.1 min



No match to MS2 spectrum in UniCarbKB

Glycan #23

Precursor: m/z = 934.4 (2-)
$(M-H)^-$ = 1869.8 Da
LC retention time: 38.8 min

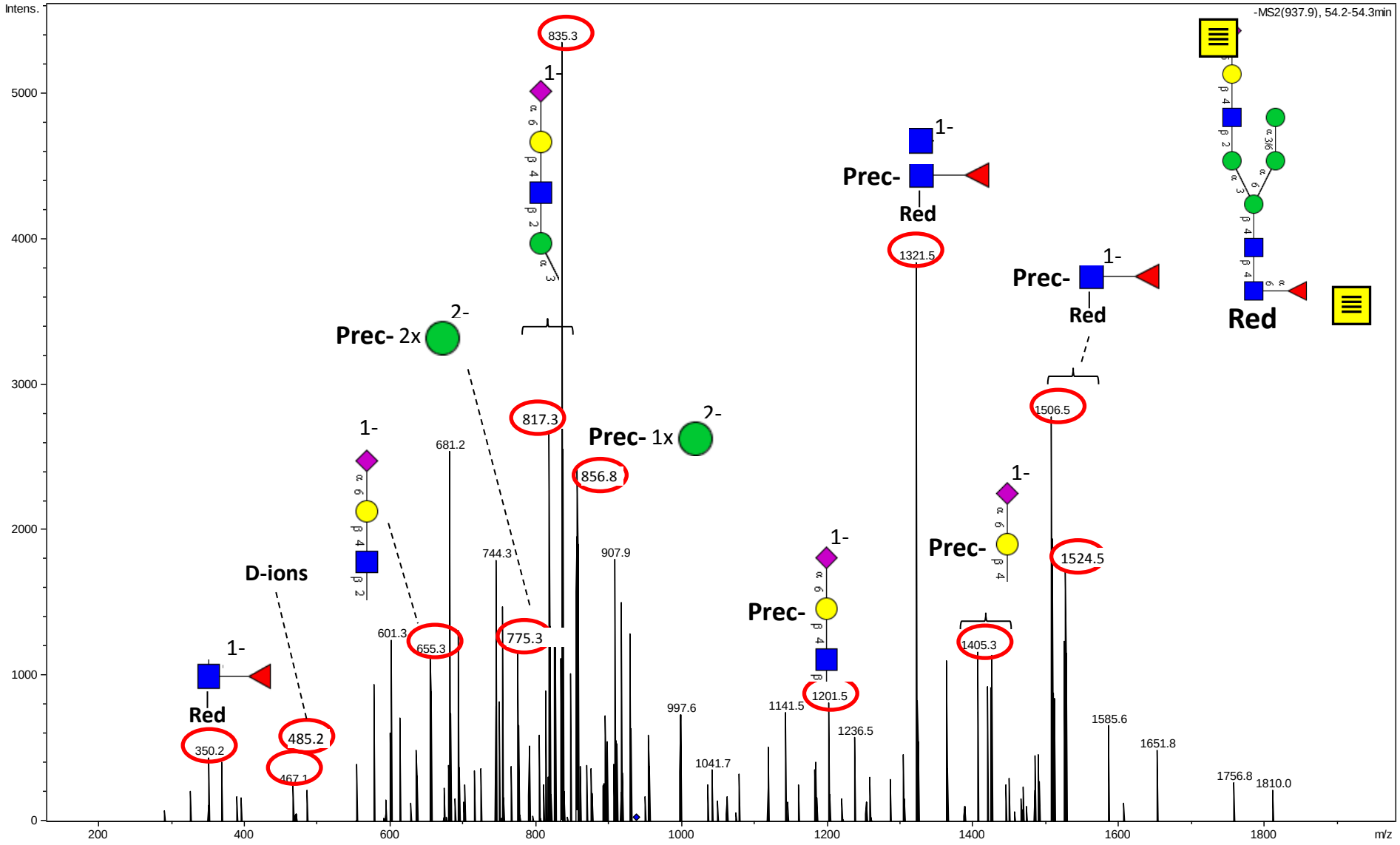


No match to MS2 spectrum in UniCarbKB

Glycan #24A

(Same as Glycan#24B)

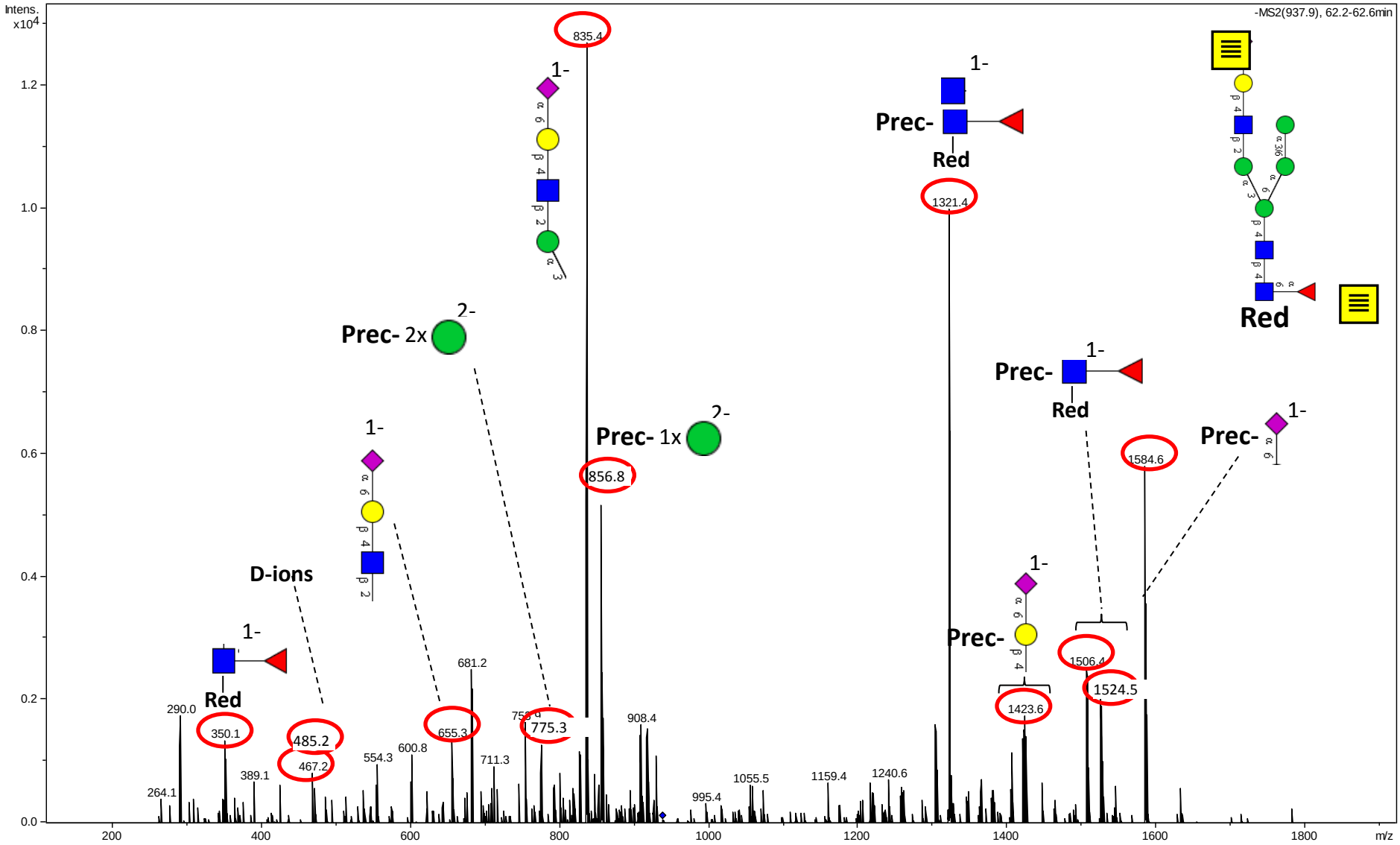
Precursor: m/z = 937.4 (2-)
$(M-H)^-$ = 1875.8 Da
LC retention time: 54.2 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #24C

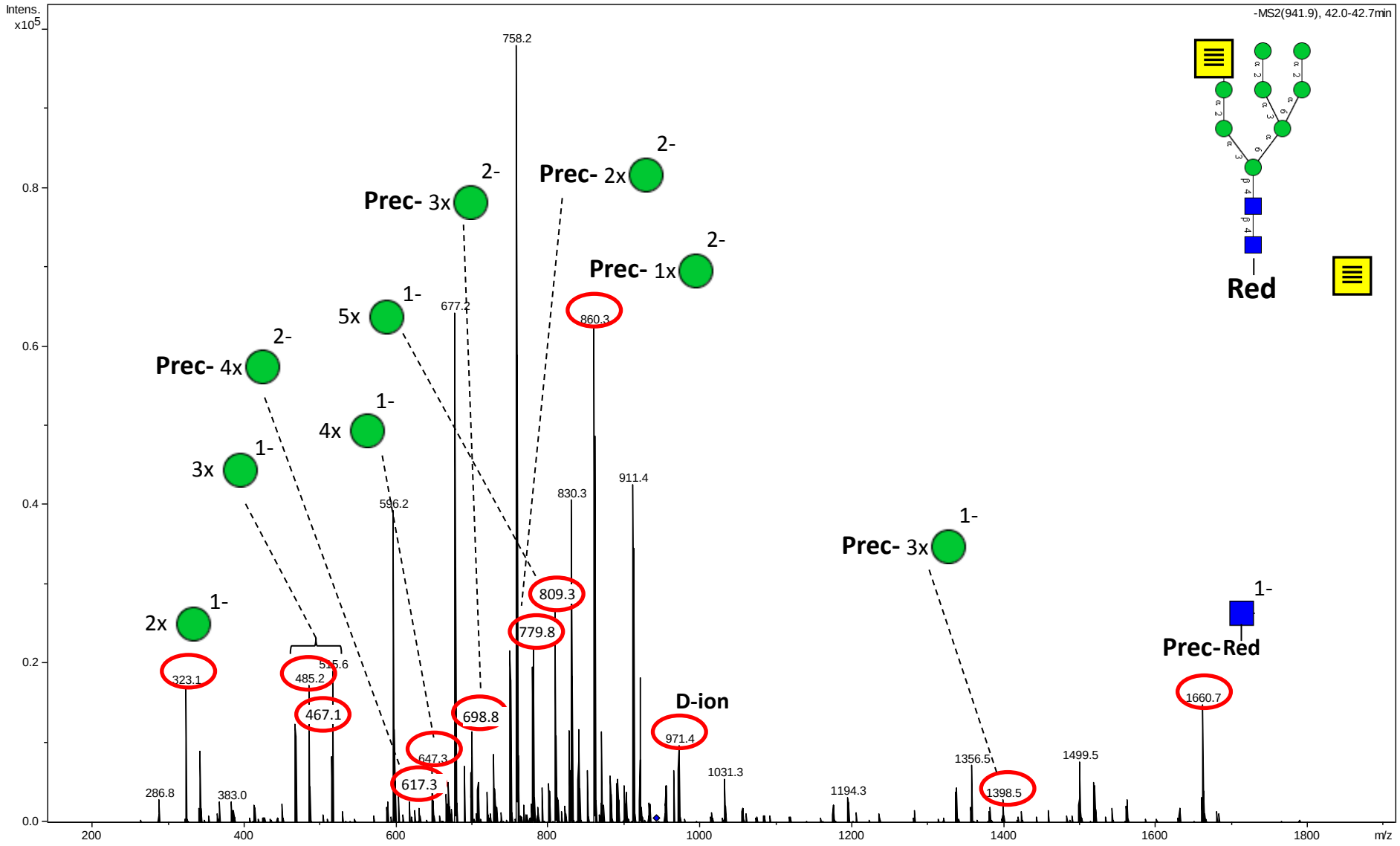
Precursor: m/z = 937.4 (2-)
$(M-H)^-$ = 1875.8 Da
LC retention time: 62.3 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #25

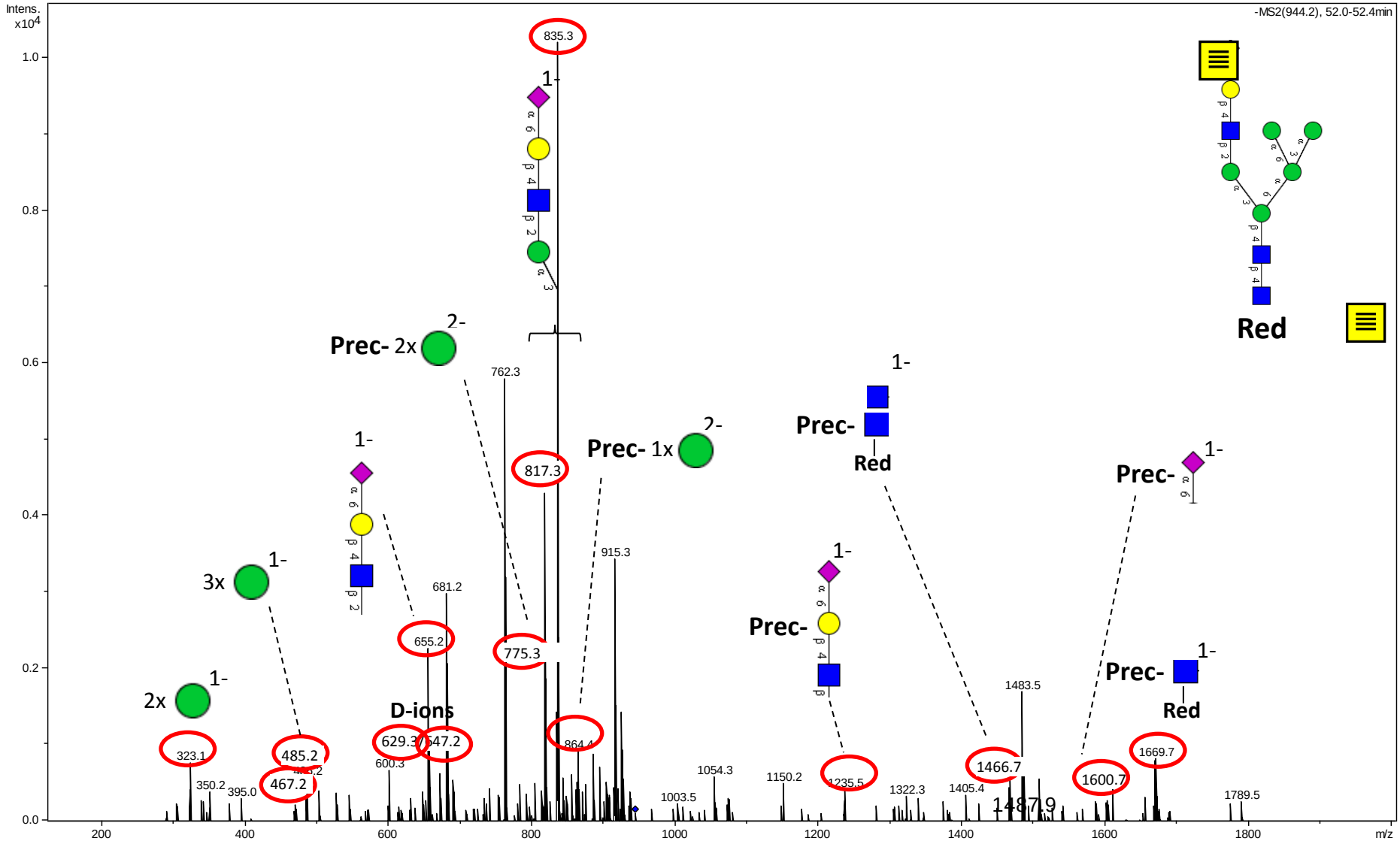
Precursor: m/z = 941.4 (2-)
$(M-H)^-$ = 1883.8 Da
LC retention time: 42.3 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #26A

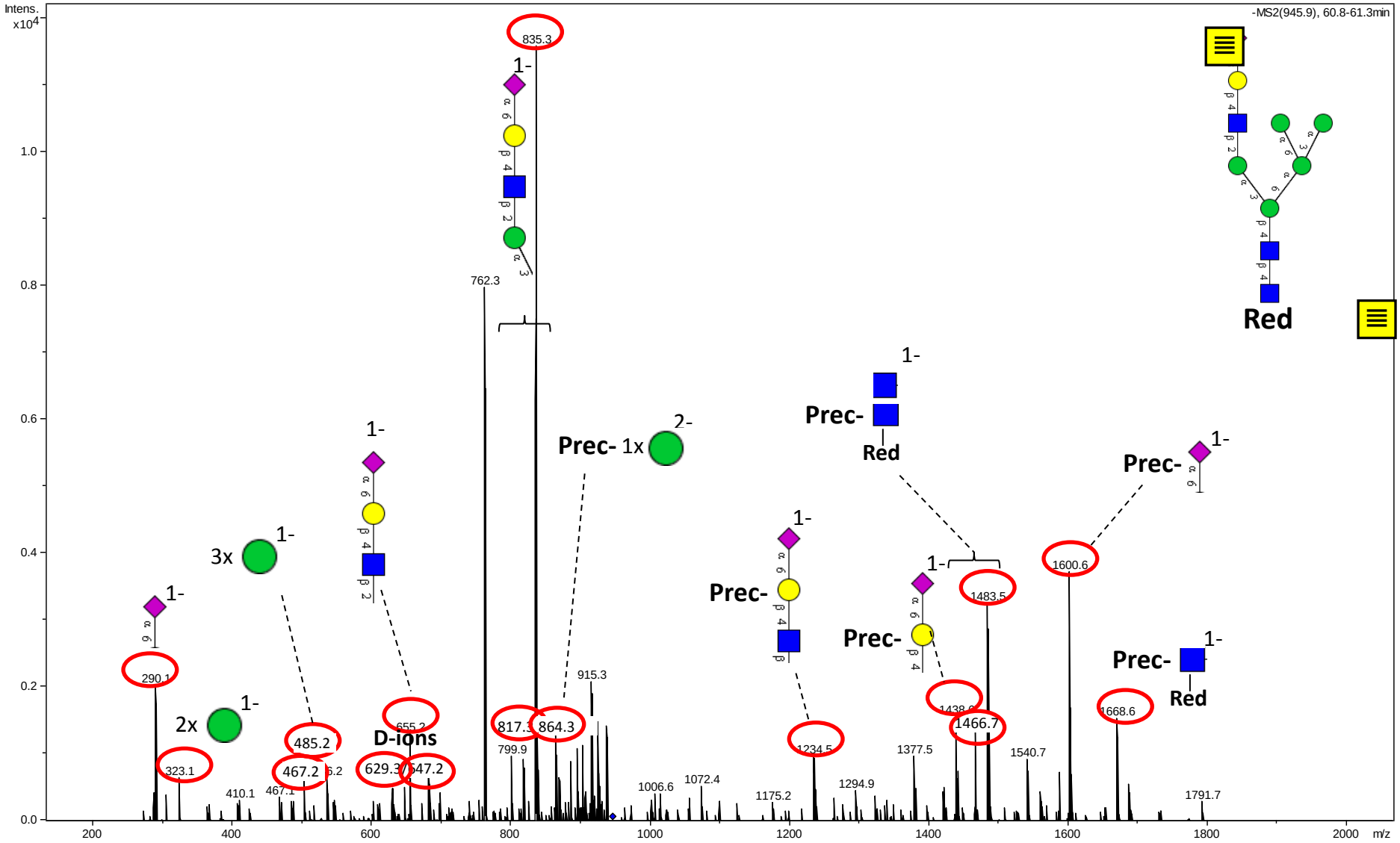
Precursor: m/z = 945.3 (2-)
$(M-H)^-$ = 1891.6 Da
LC retention time: 52.1 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #26B

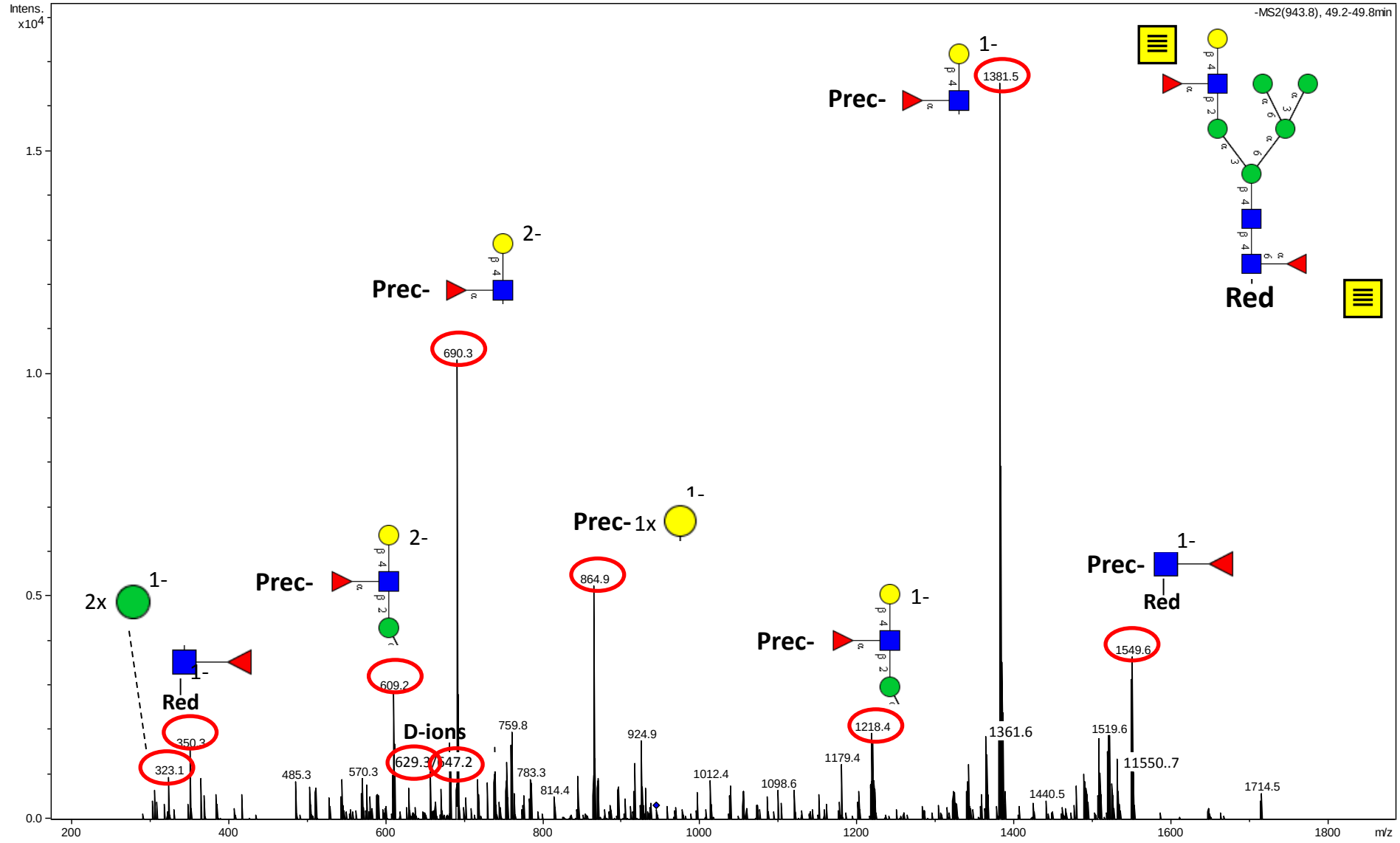
Precursor: m/z = 945.3 (2-)
$(M-H)^-$ = 1891.6 Da
LC retention time: 61.0 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #27

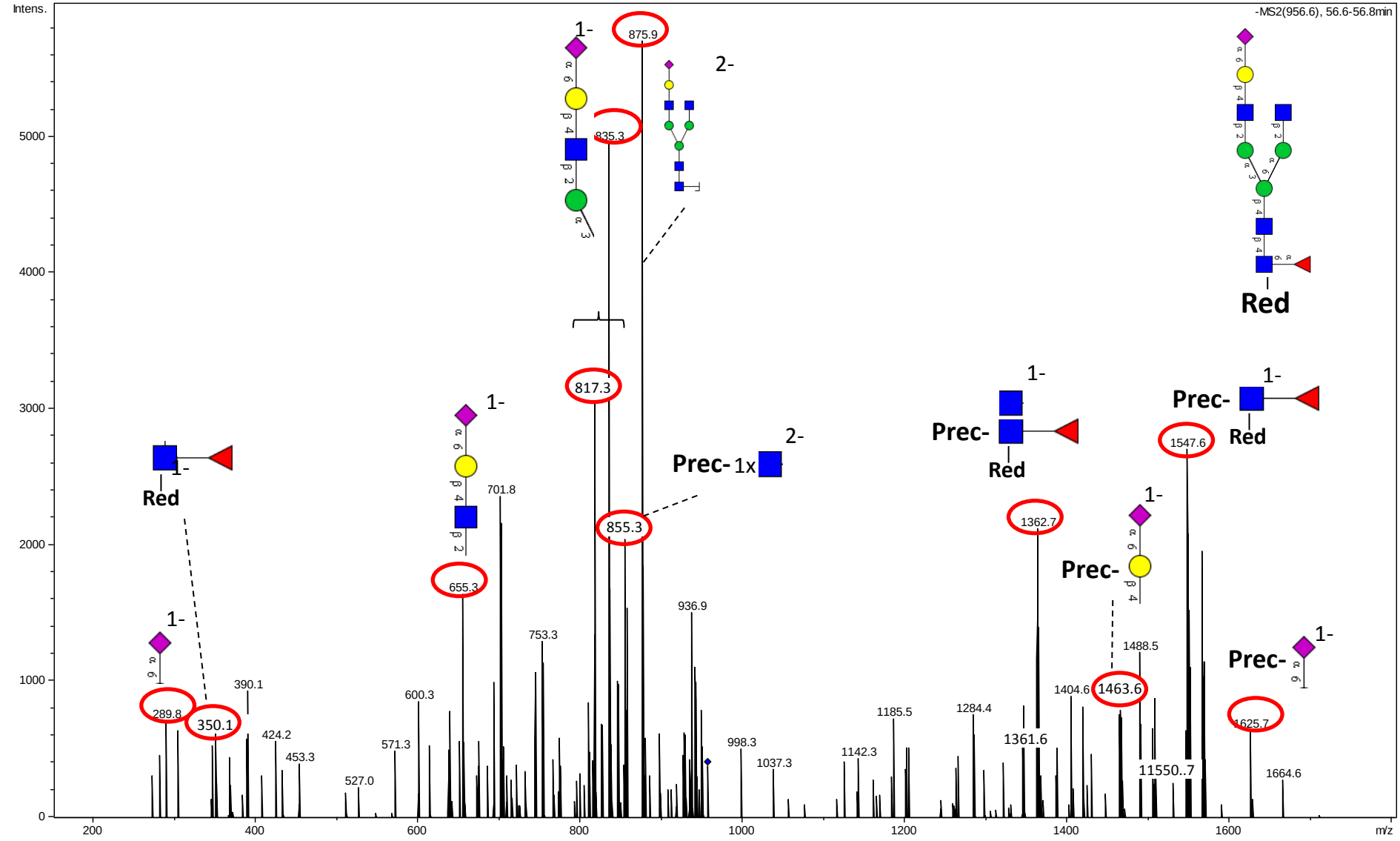
Precursor: m/z = 945.9 (2-)
$(M-H)^-$ = 1892.8 Da
LC retention time: 49.3 min



No match to MS2 spectrum in UniCarbKB

Glycan #28A

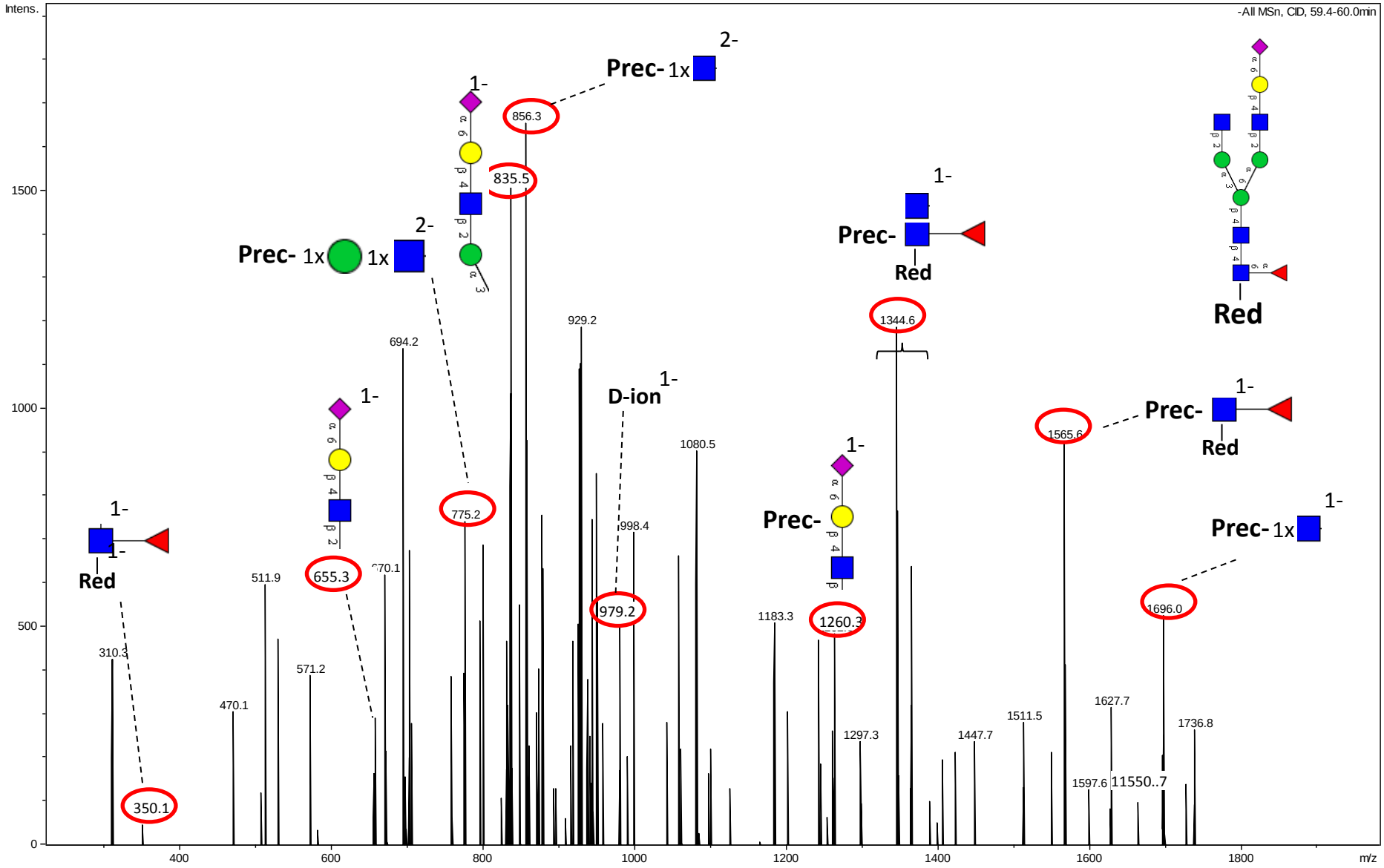
Precursor: m/z = 957.9 (2-)
$(M-H)^-$ = 1916.8 Da
LC retention time: 56.8 min



Positive match to MS2 spectrum in UniCarbKB

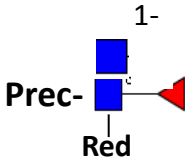
Glycan #28B

Precursor: m/z = 957.9 (2-)
$(M-H)^-$ = 1916.8 Da
LC retention time: 59.4 min

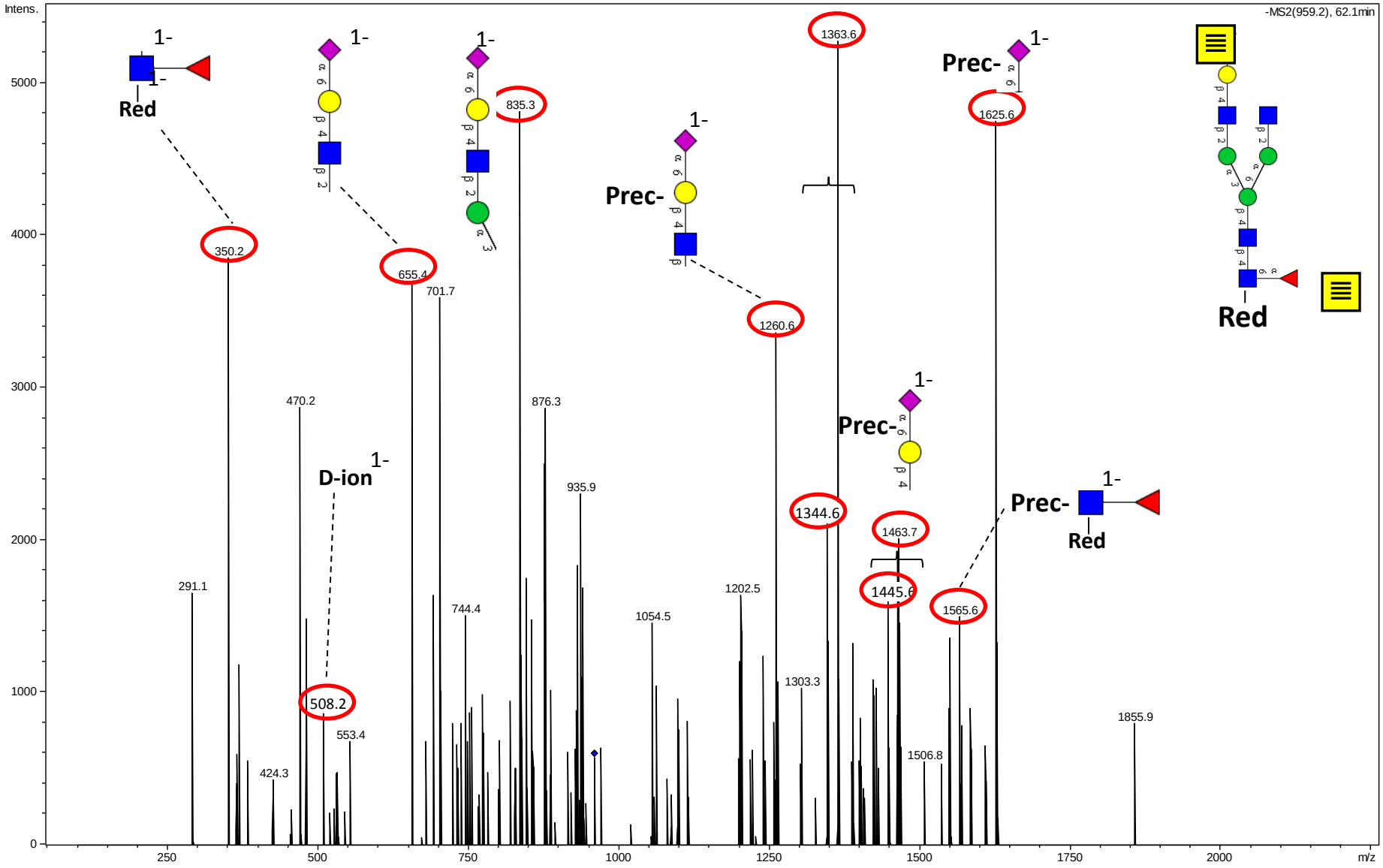


No match to MS2 spectrum in UniCarbKB

Glycan #28C



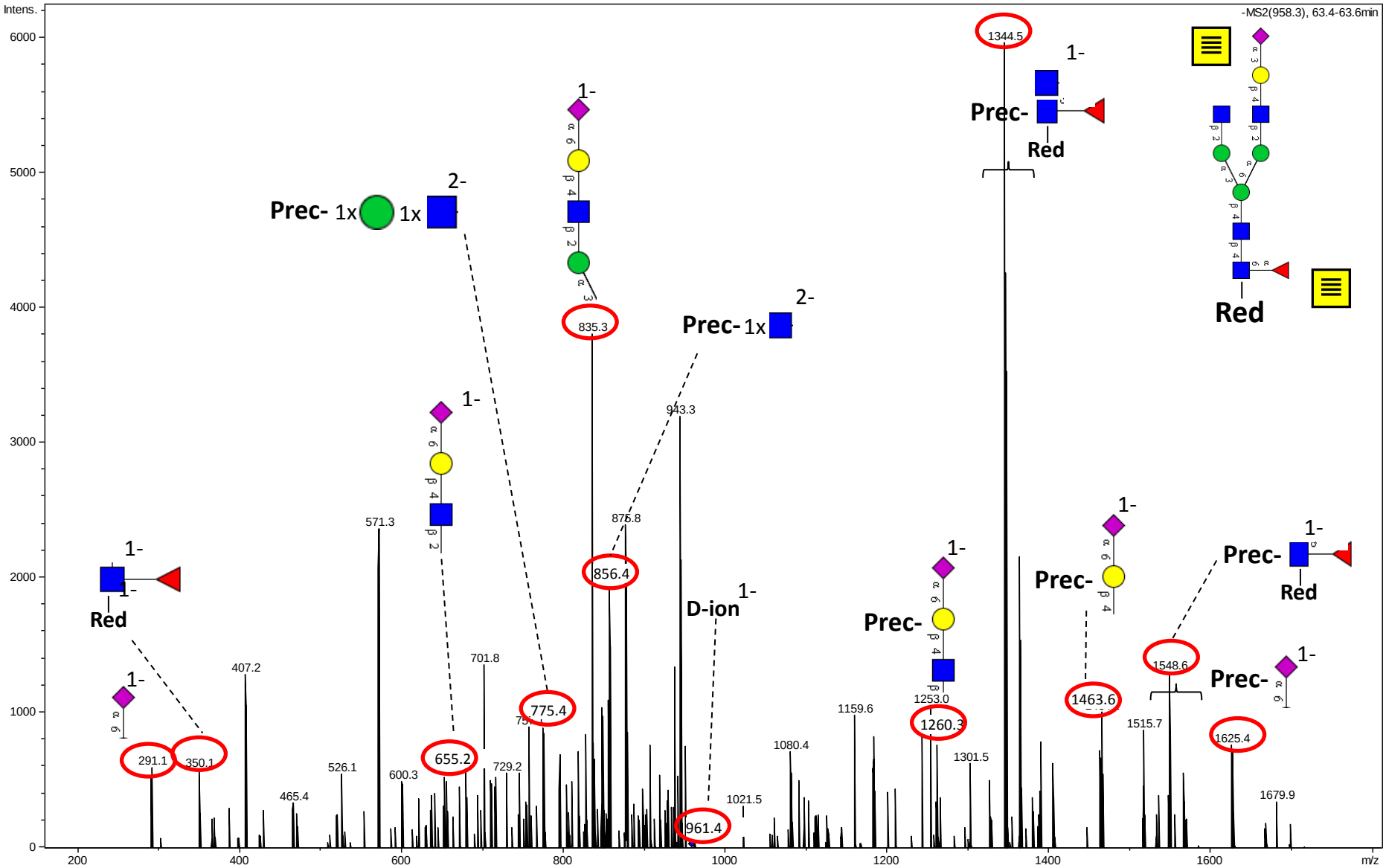
Precursor: m/z = 957.9 (2-)
$(M-H)^-$ = 1916.8 Da
LC retention time: 62.1 min



No match to MS2 spectrum in UniCarbKB

Glycan #28D

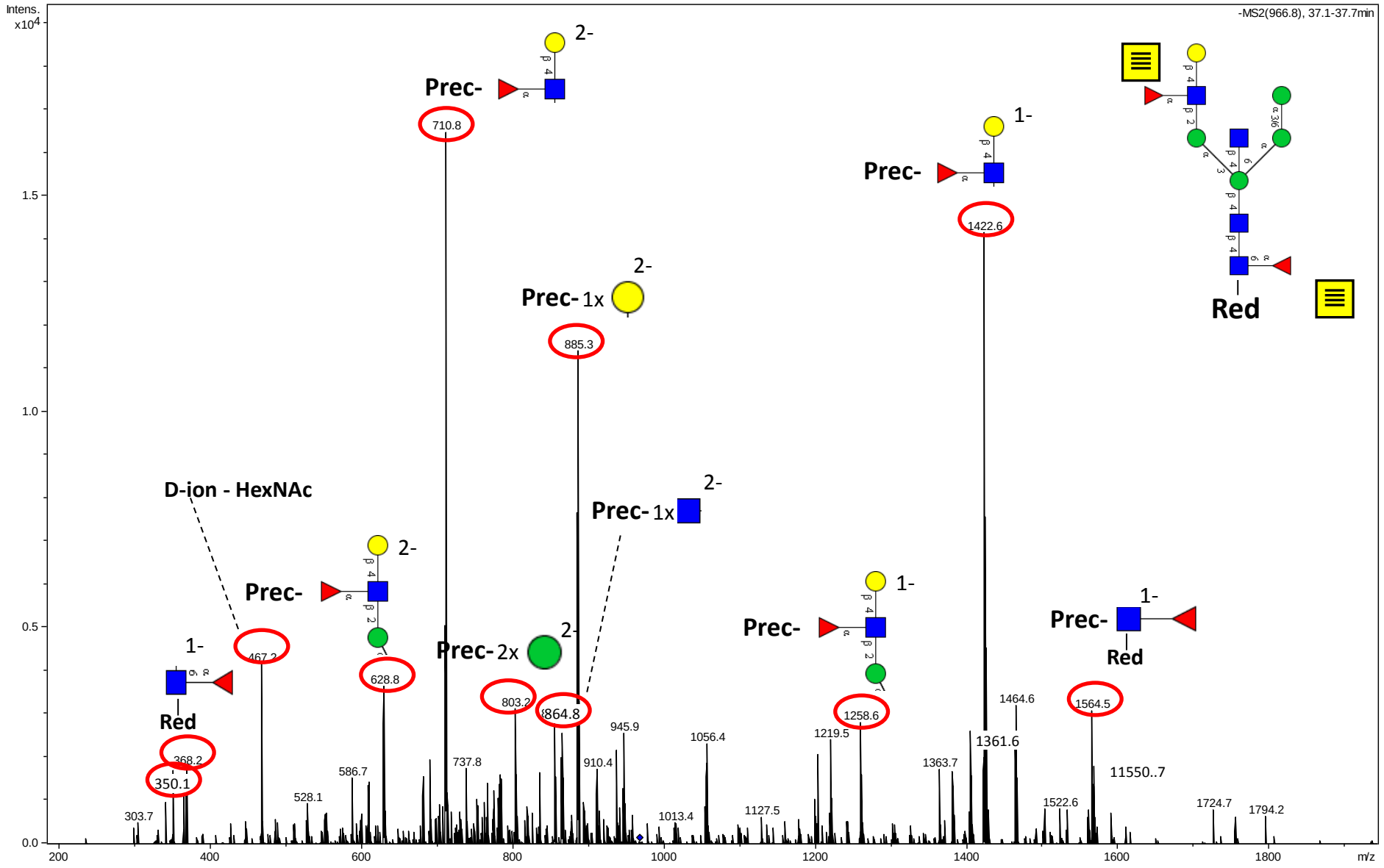
Precursor: m/z = 957.9 (2-)
$(M-H)^-$ = 1916.8 Da
LC retention time: 63.1 min



No match to MS2 spectrum in UniCarbKB

Glycan #29

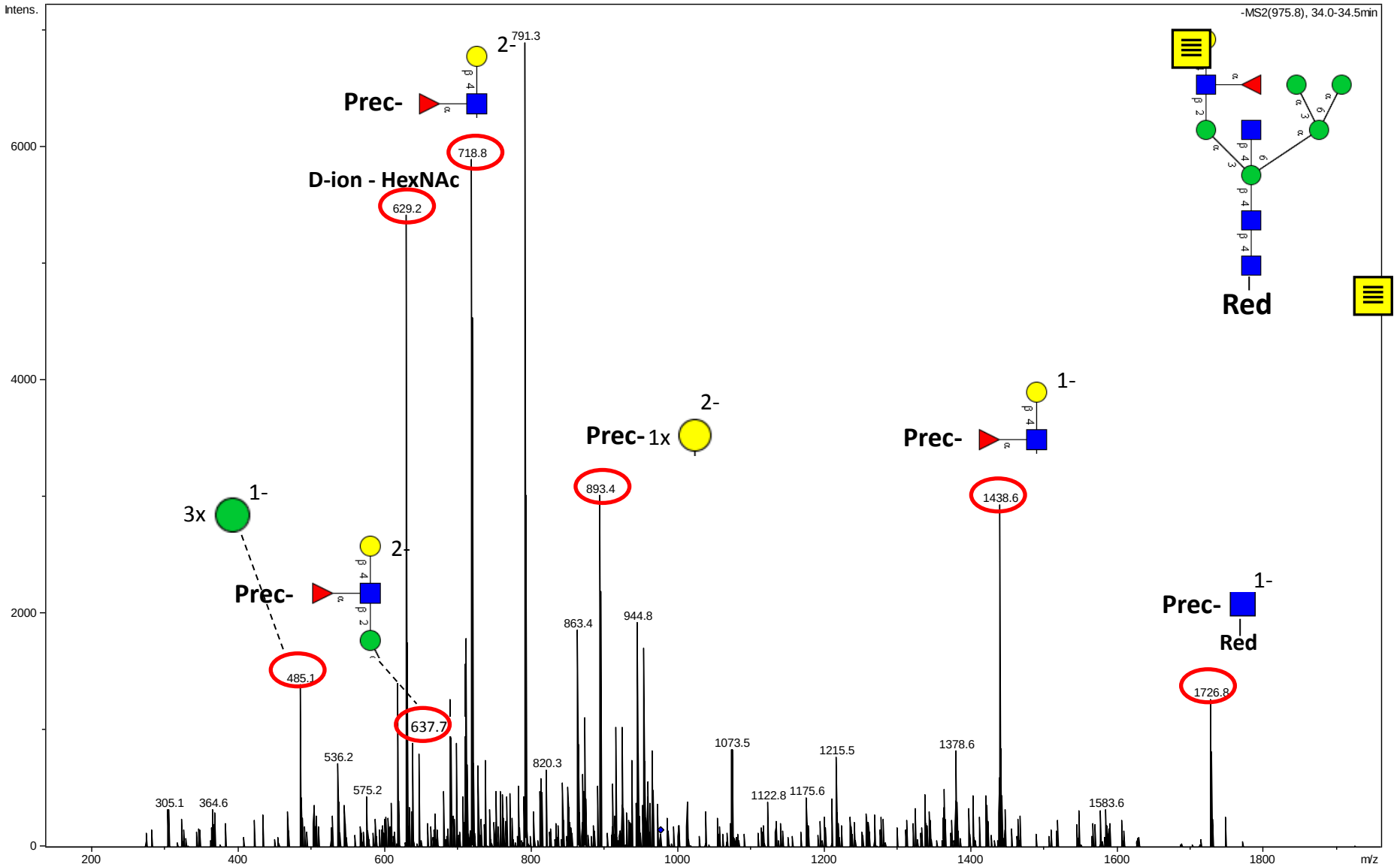
Precursor: m/z = 966.4 (2-)
$(M-H)^-$ = 1933.8 Da
LC retention time: 49.3 min



No match to MS2 spectrum in UniCarbKB

Glycan #30A

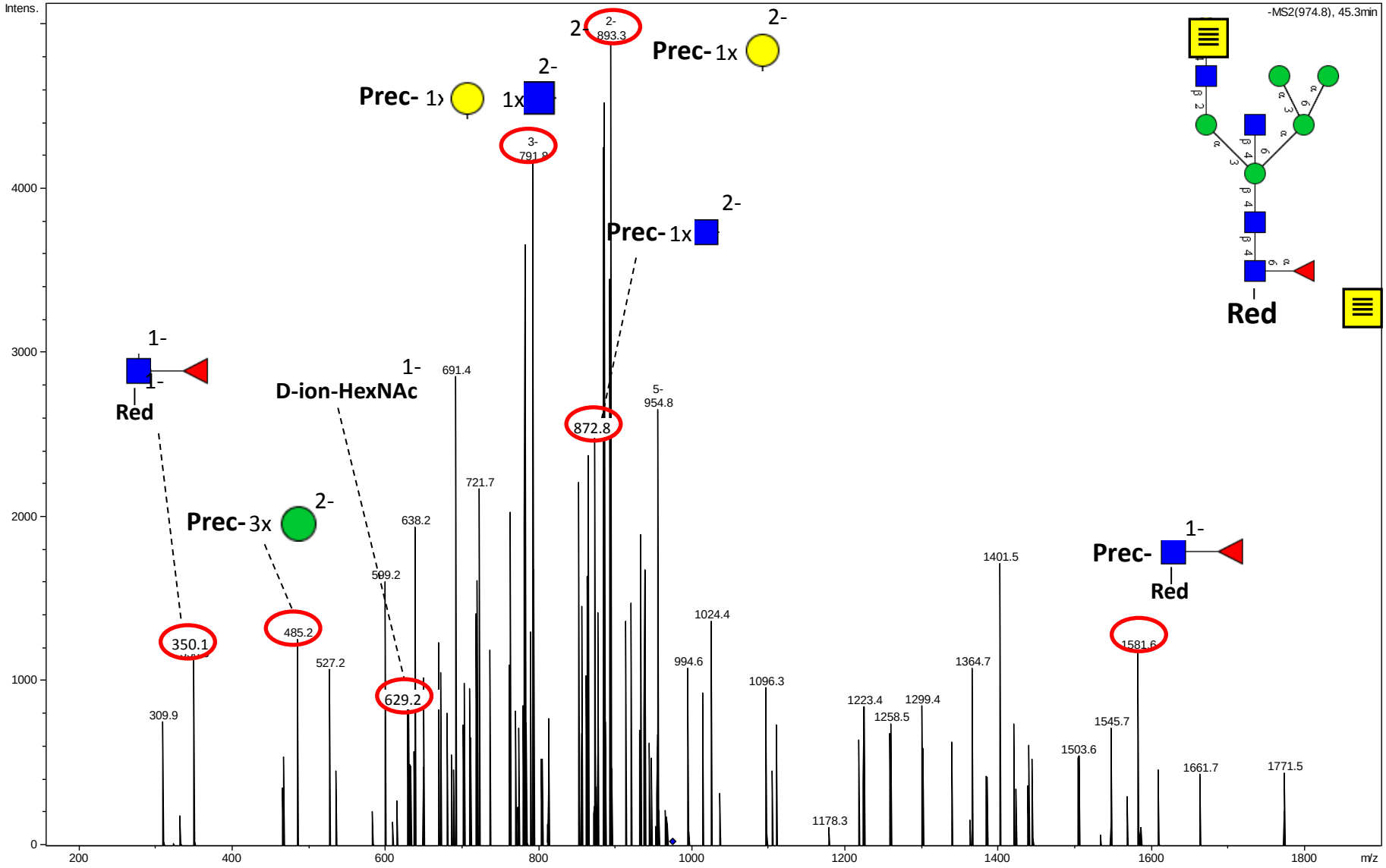
Precursor: m/z = 974.4 (2-)
$(M-H)^-$ = 1949.8 Da
LC retention time: 34.2 min



No match to MS2 spectrum in UniCarbKB

Glycan #30B

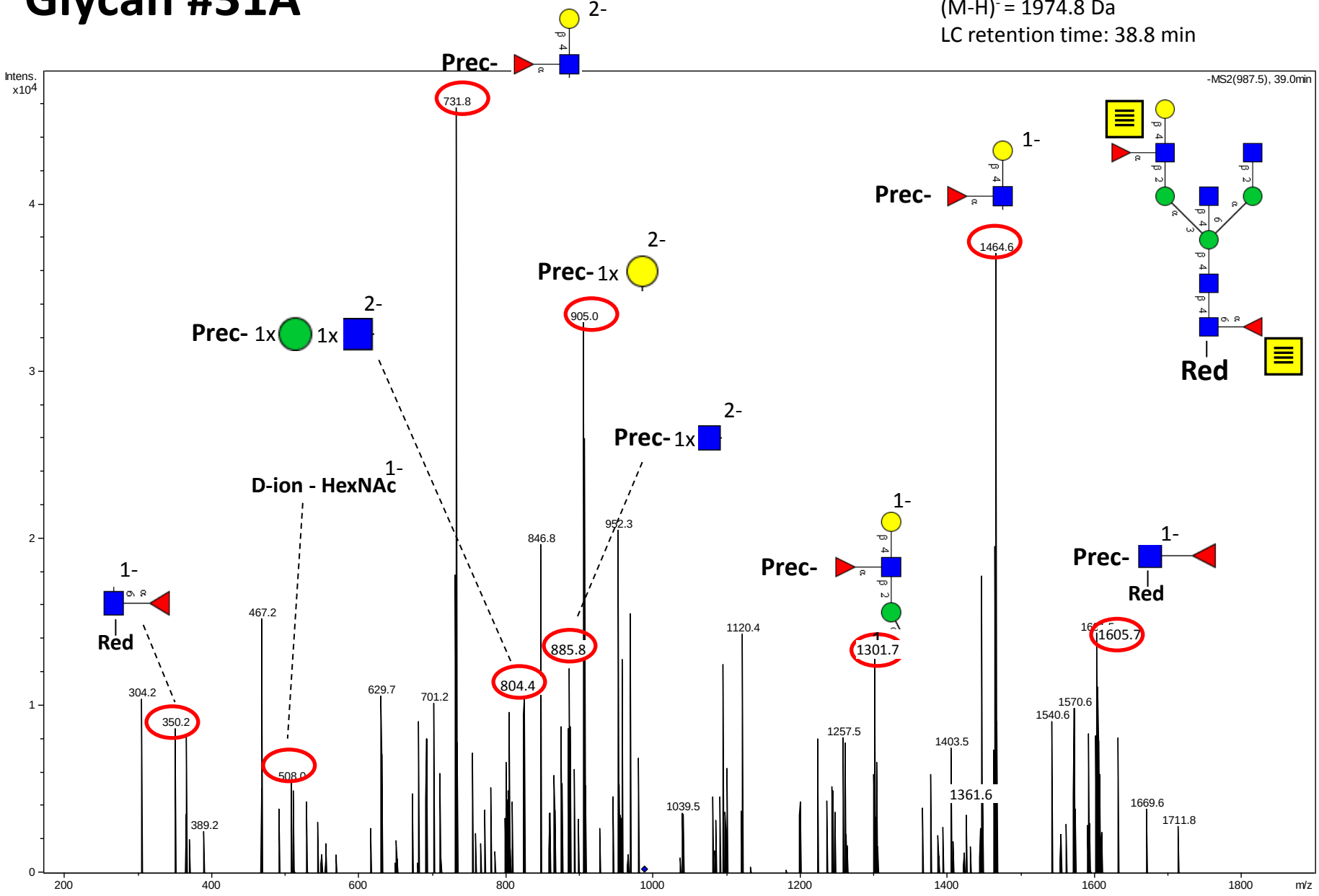
Precursor: m/z = 974.4 (2-)
$(M-H)^-$ = 1949.8 Da
LC retention time: 45.2 min



No match to MS2 spectrum in UniCarbKB

Glycan #31A

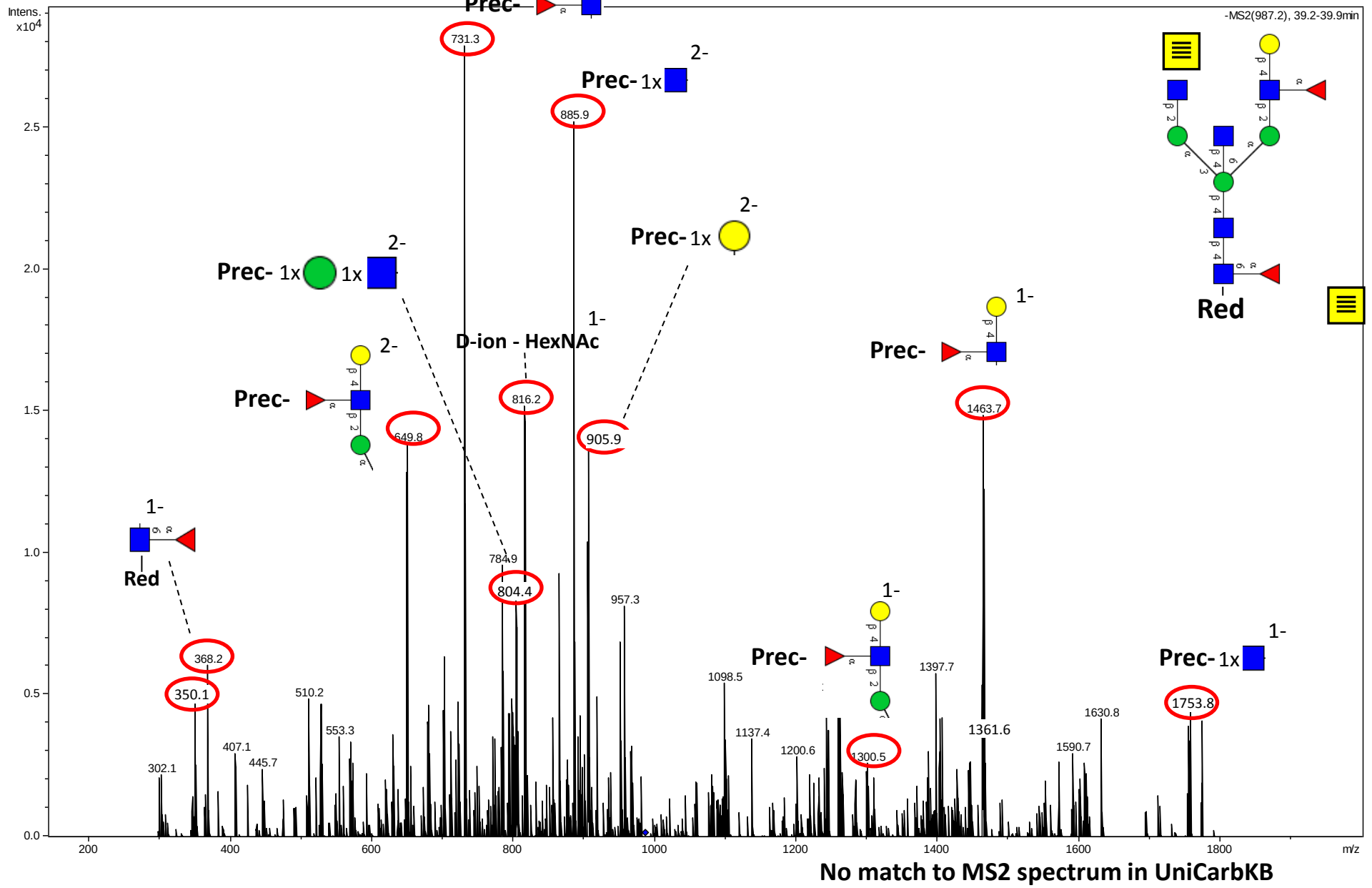
Precursor: m/z = 986.94 (2-)
$(M-H)^-$ = 1974.8 Da
LC retention time: 38.8 min



No match to MS2 spectrum in UniCarbKB

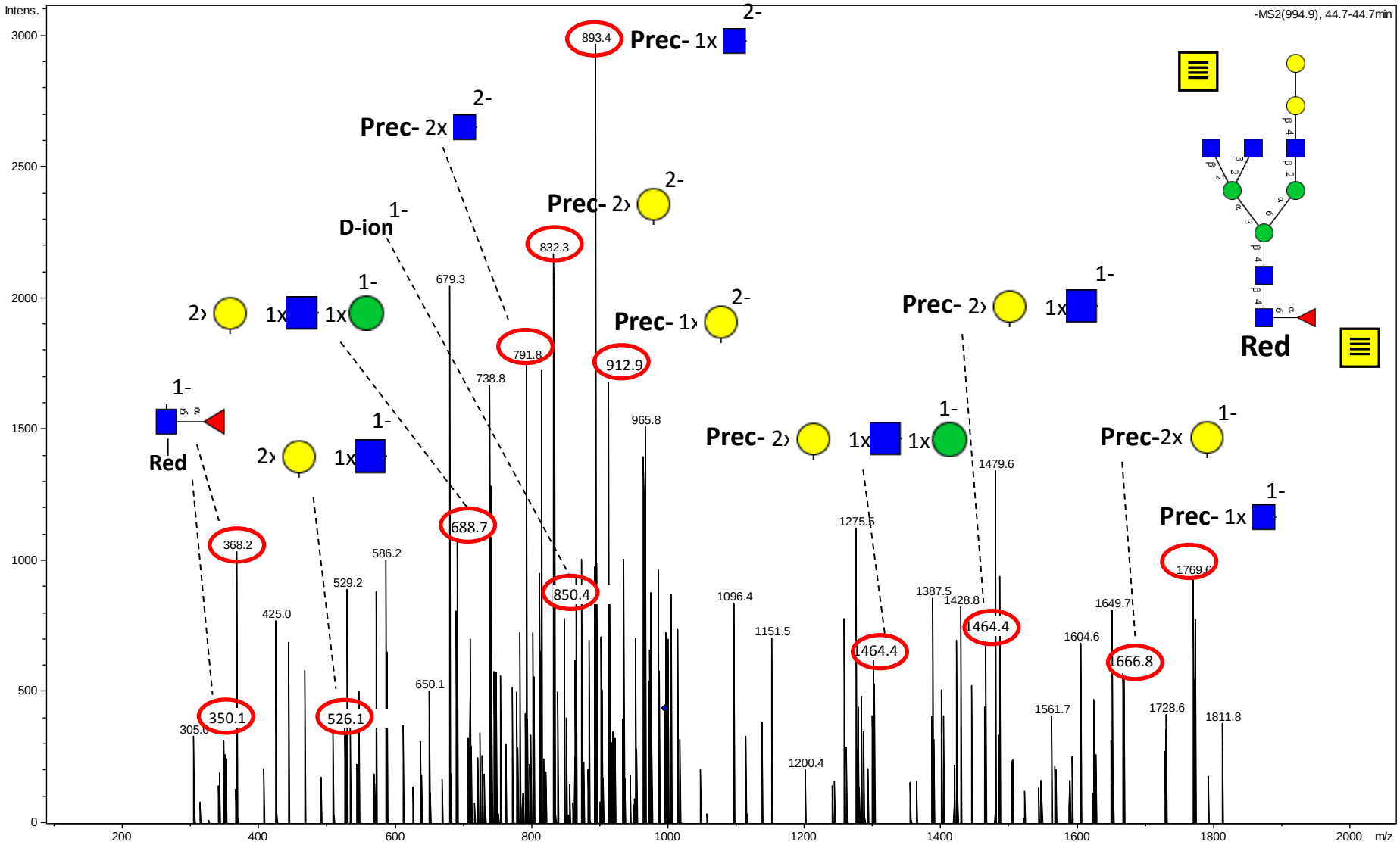
Glycan #31B

Precursor: m/z = 986.94 (2-)
$(M-H)^-$ = 1974.8 Da
LC retention time: 39.3 min



Glycan #32

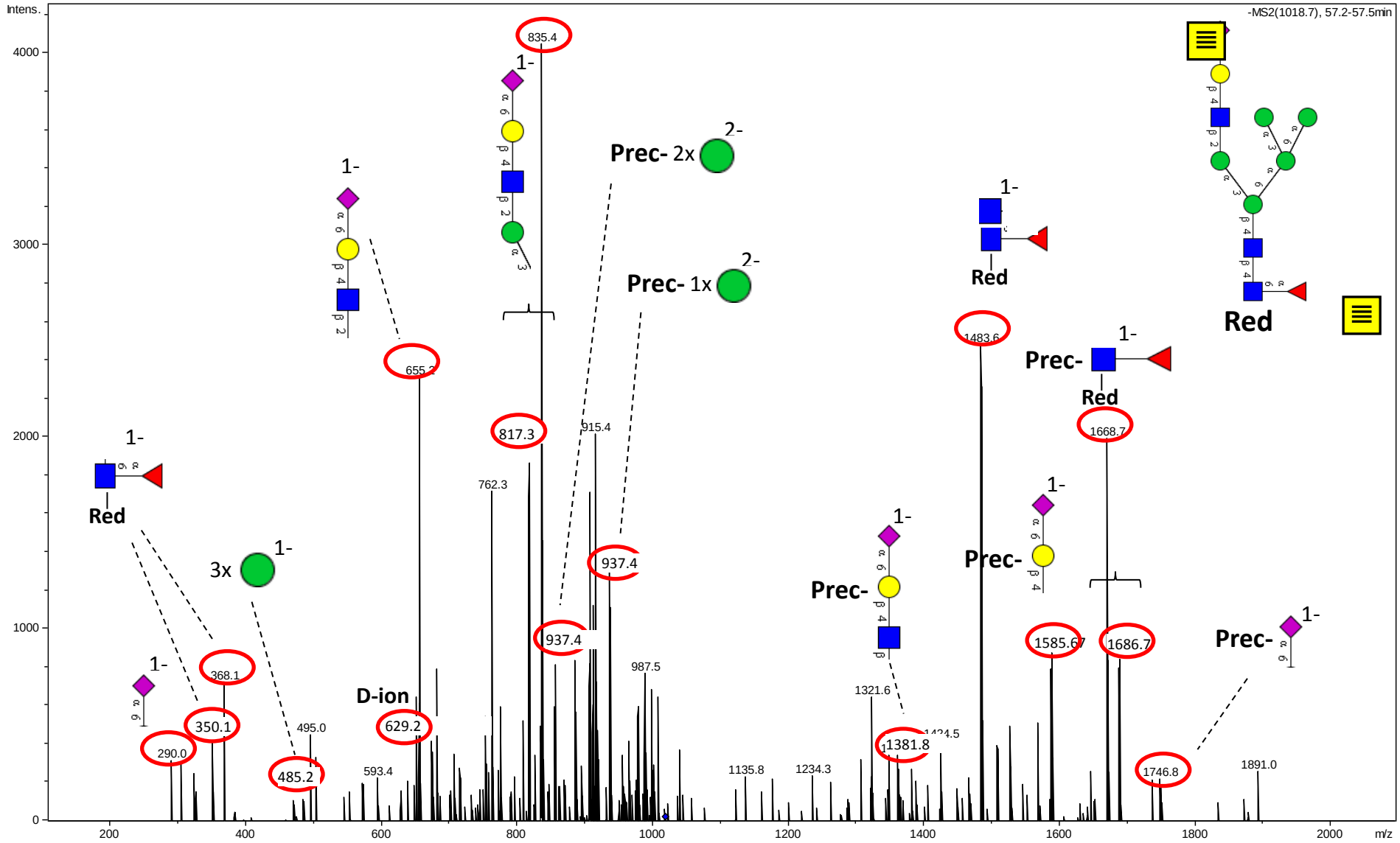
Precursor: m/z = 994.9 (2-)
$(M-H)^-$ = 1990.8 Da
LC retention time: 44.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #33A

Precursor: m/z =1018.4 (2-)
$(M-H)^-$ = 2037.8 Da
LC retention time: 57.5 min

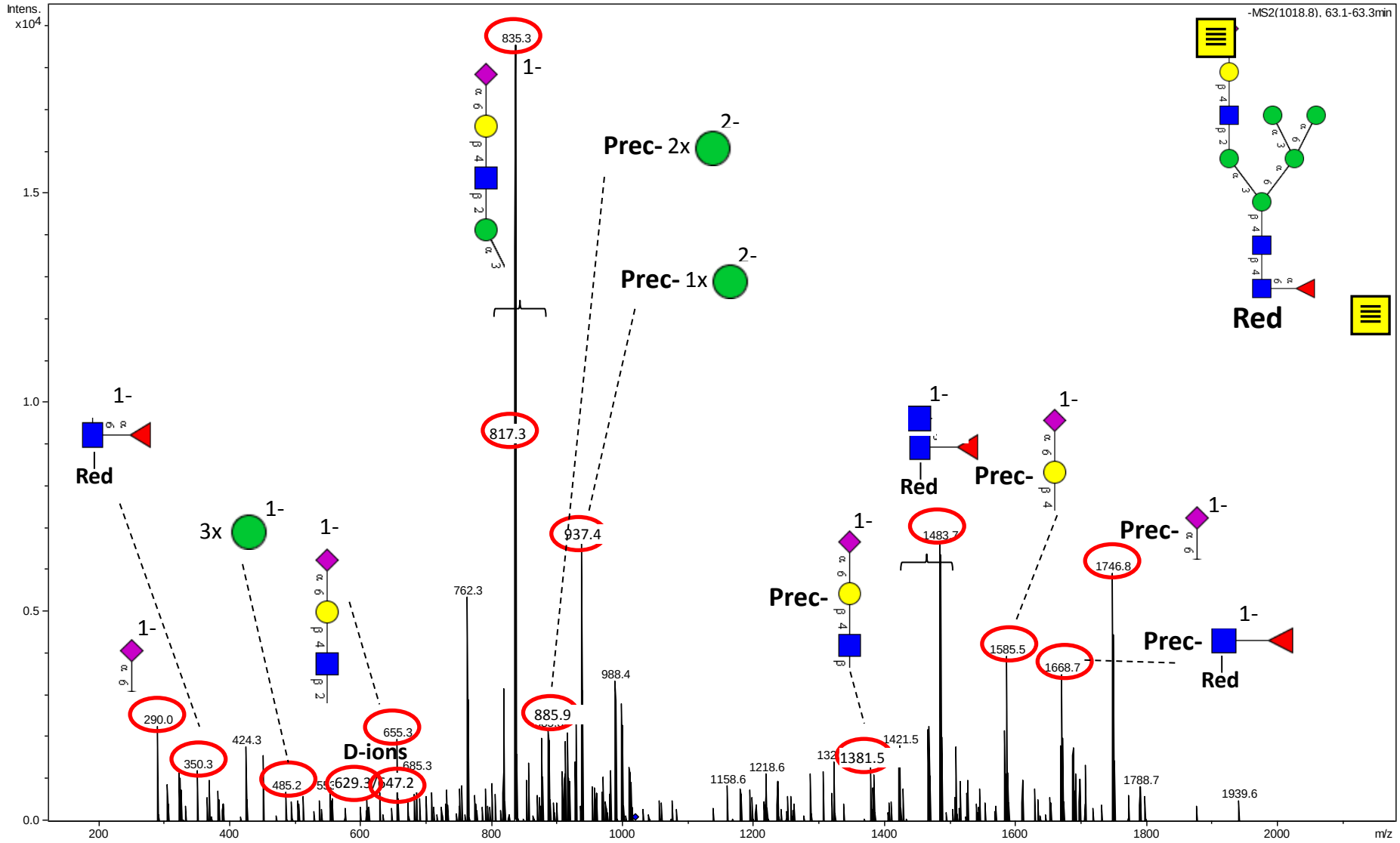


No match to MS2 spectrum in UniCarbKB

Glycan #33C

(Same as Glycan#33B)

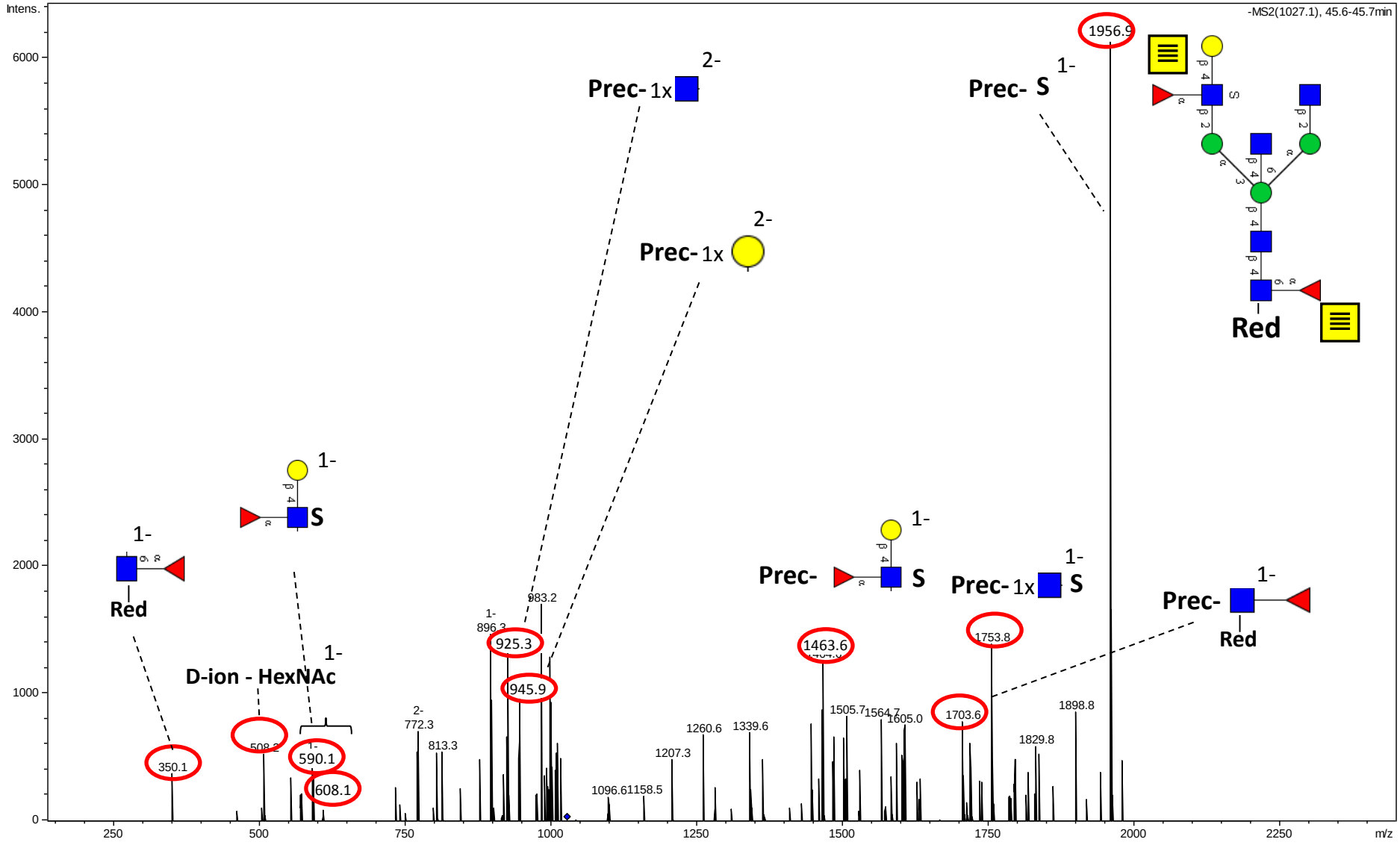
Precursor: m/z =1018.4 (2-)
$(M-H)^-$ = 2037.8 Da
LC retention time: 63.2 min



No match to MS2 spectrum in UniCarbKB

Glycan #34

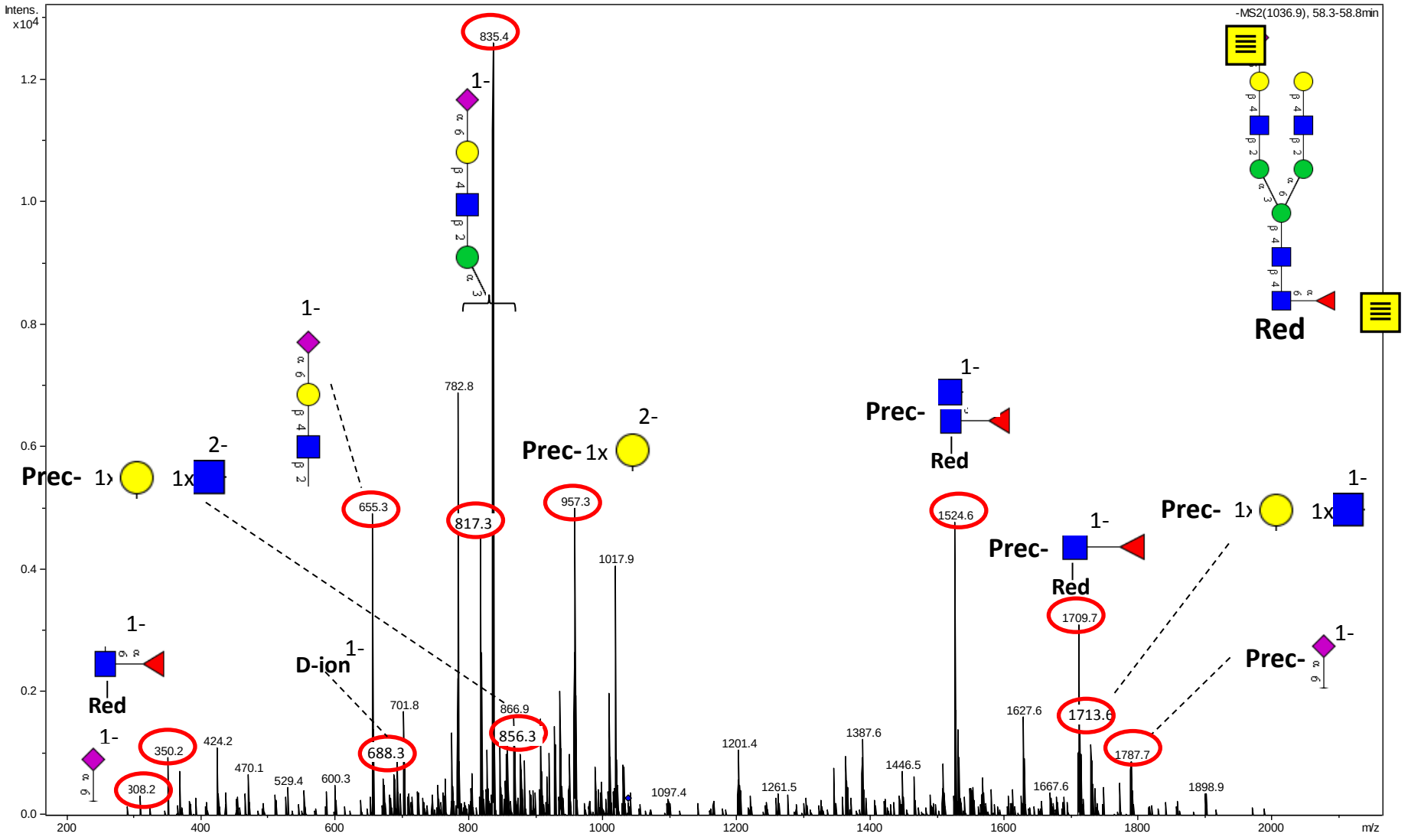
Precursor: m/z = 1026.9 (2-)
$(M-H)^-$ = 2054.8 Da
LC retention time: 45.6 min



No match to MS2 spectrum in UniCarbKB

Glycan #35A

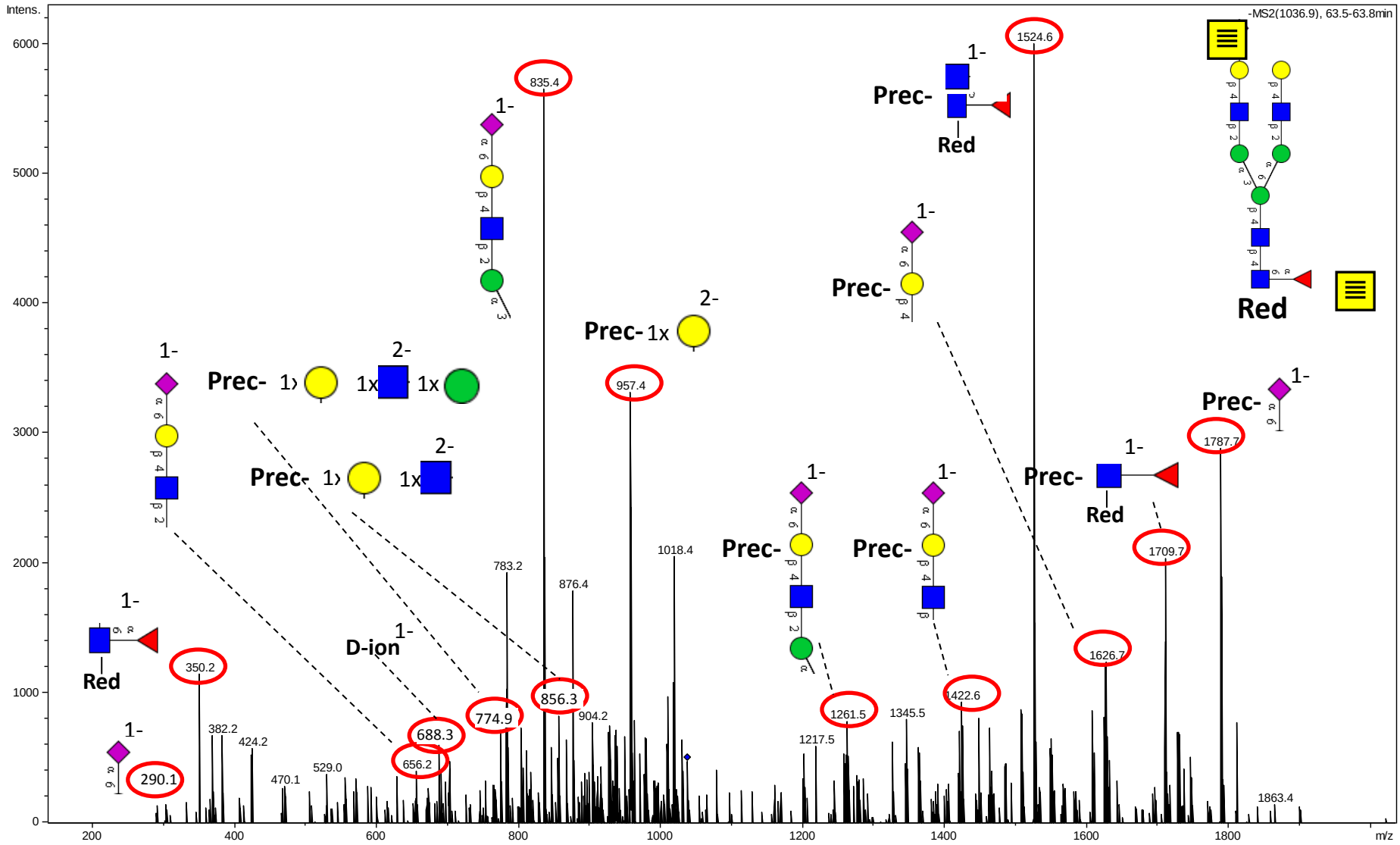
Precursor: m/z =1038.9 (2-)
$(M-H)^-$ = 2078.8 Da
LC retention time: 58.5 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #35B

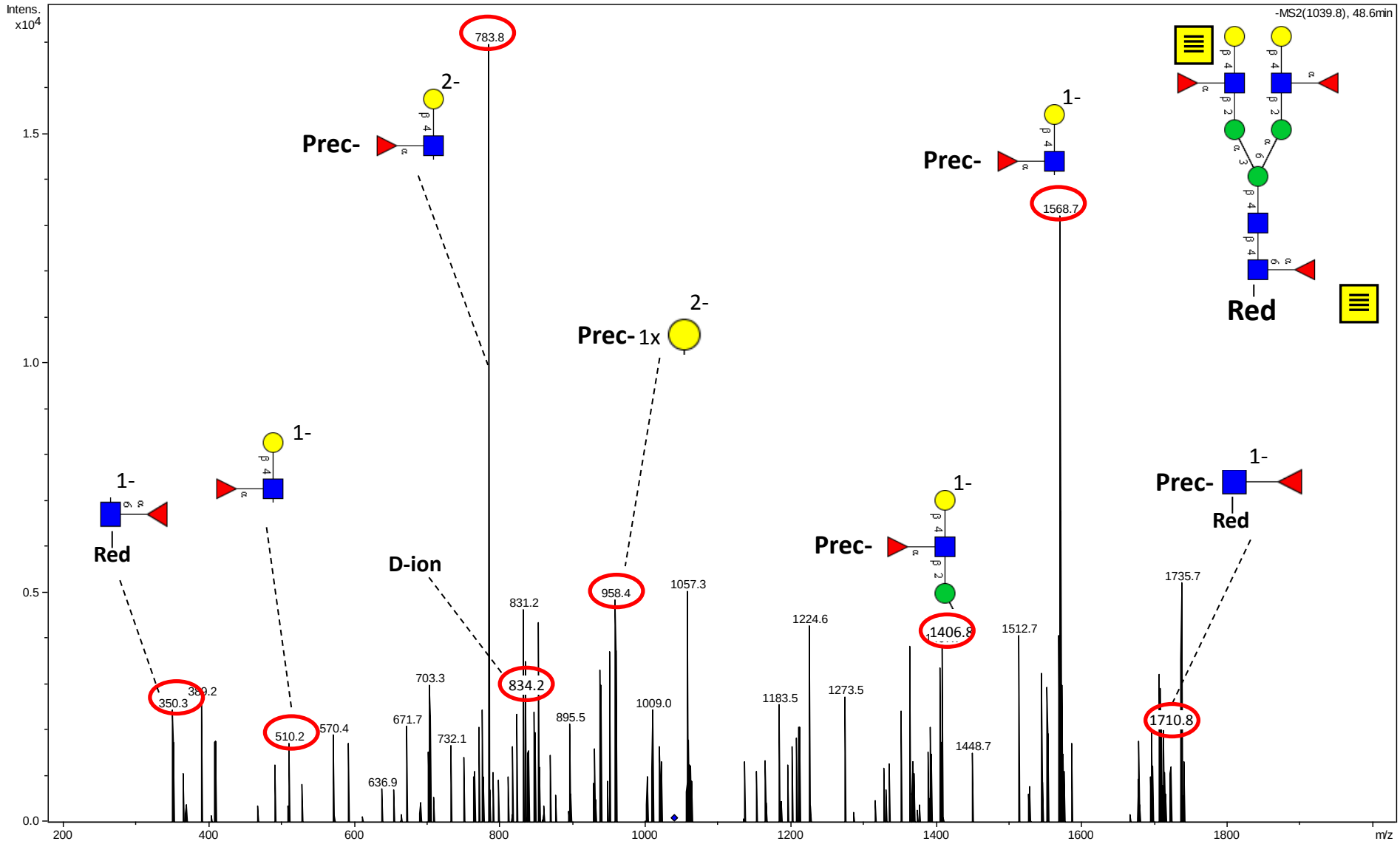
Precursor: m/z =1038.9 (2-)
$(M-H)^-$ = 2078.8 Da
LC retention time: 63.5 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #36

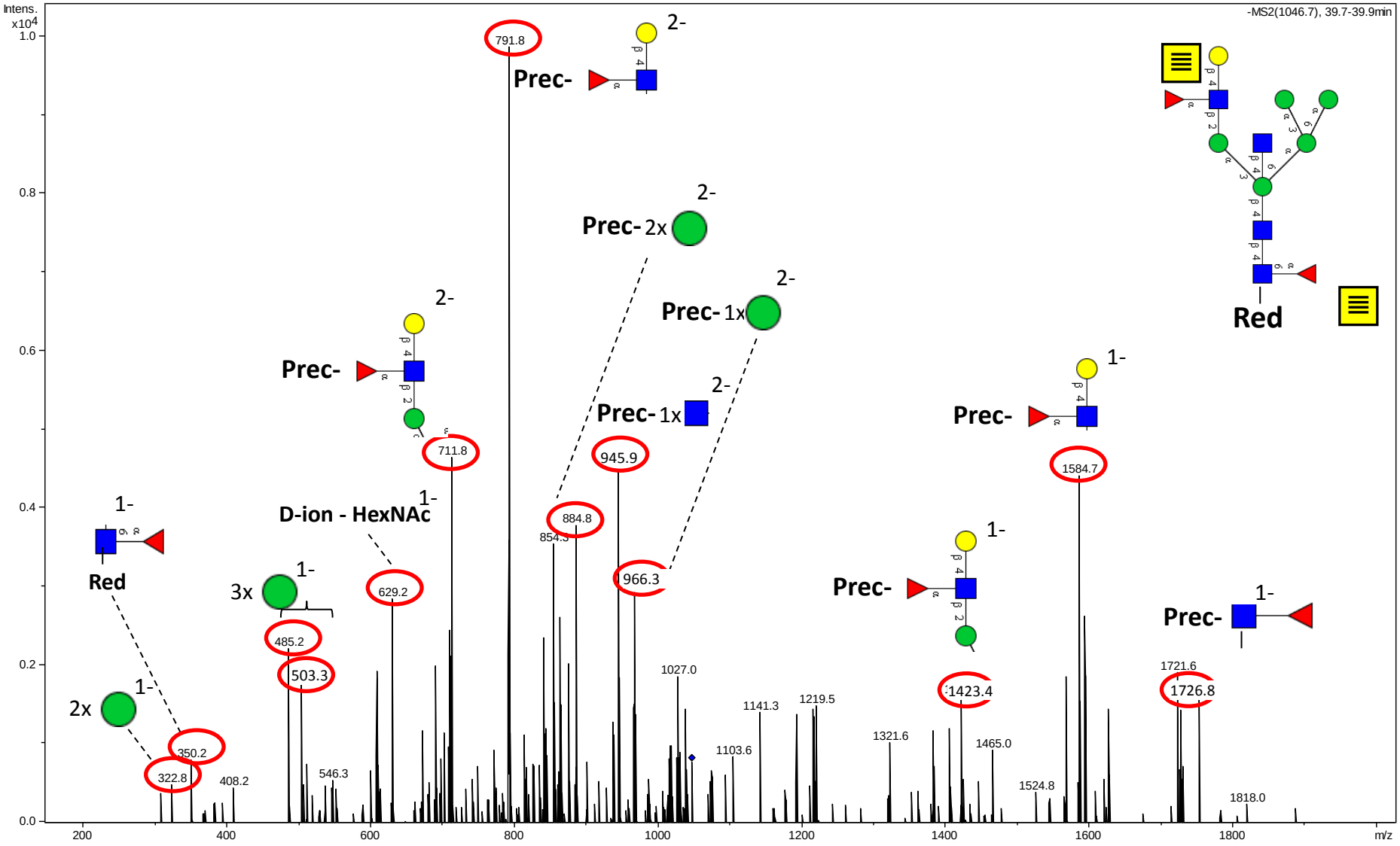
Precursor: m/z = 1039.4 (2-)
$(M-H)^-$ = 2079.8 Da
LC retention time: 48.3 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #37B

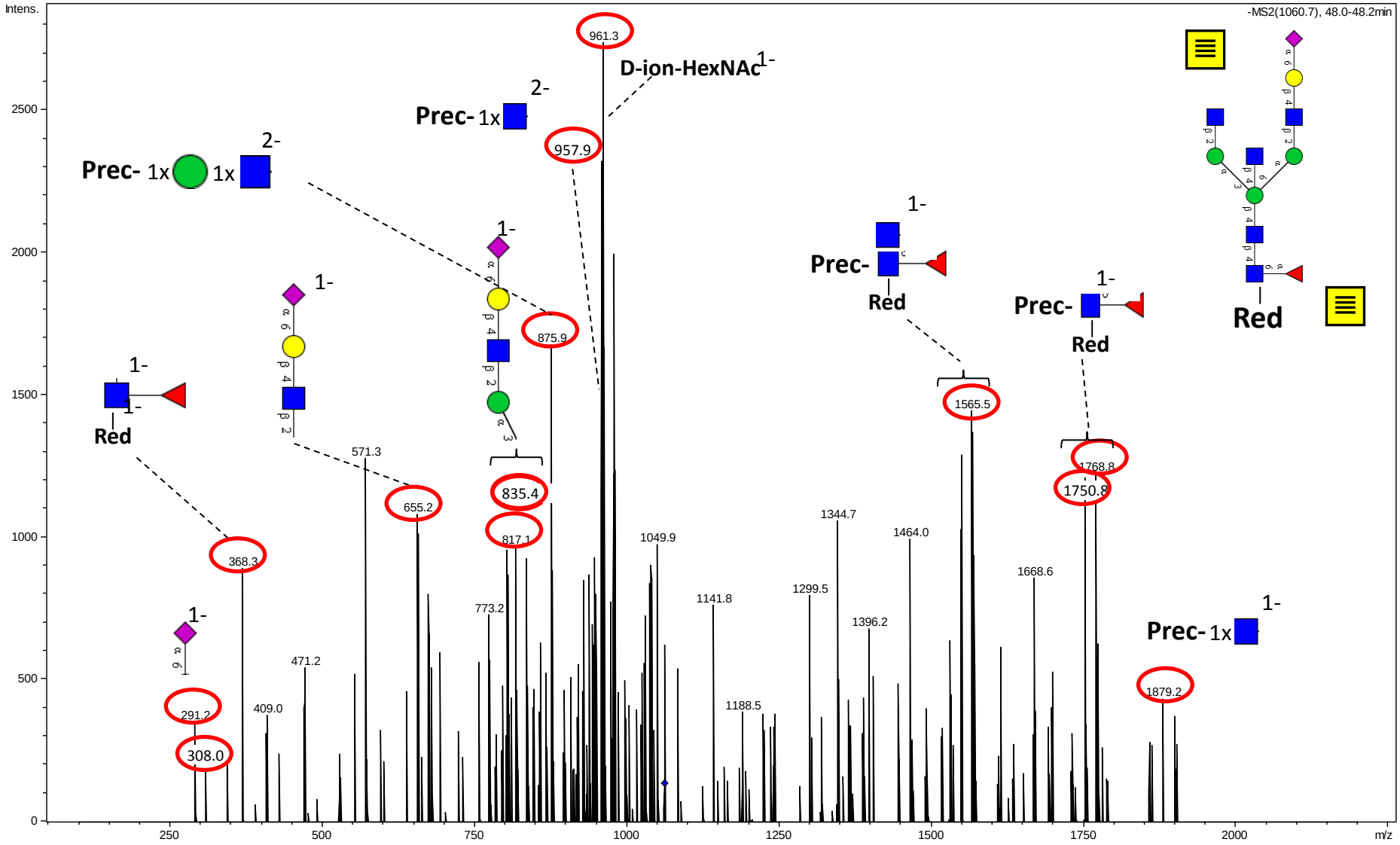
Precursor: m/z = 1047.4 (2-)
$(M-H)^-$ = 2095.8 Da
LC retention time: 39.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #38A

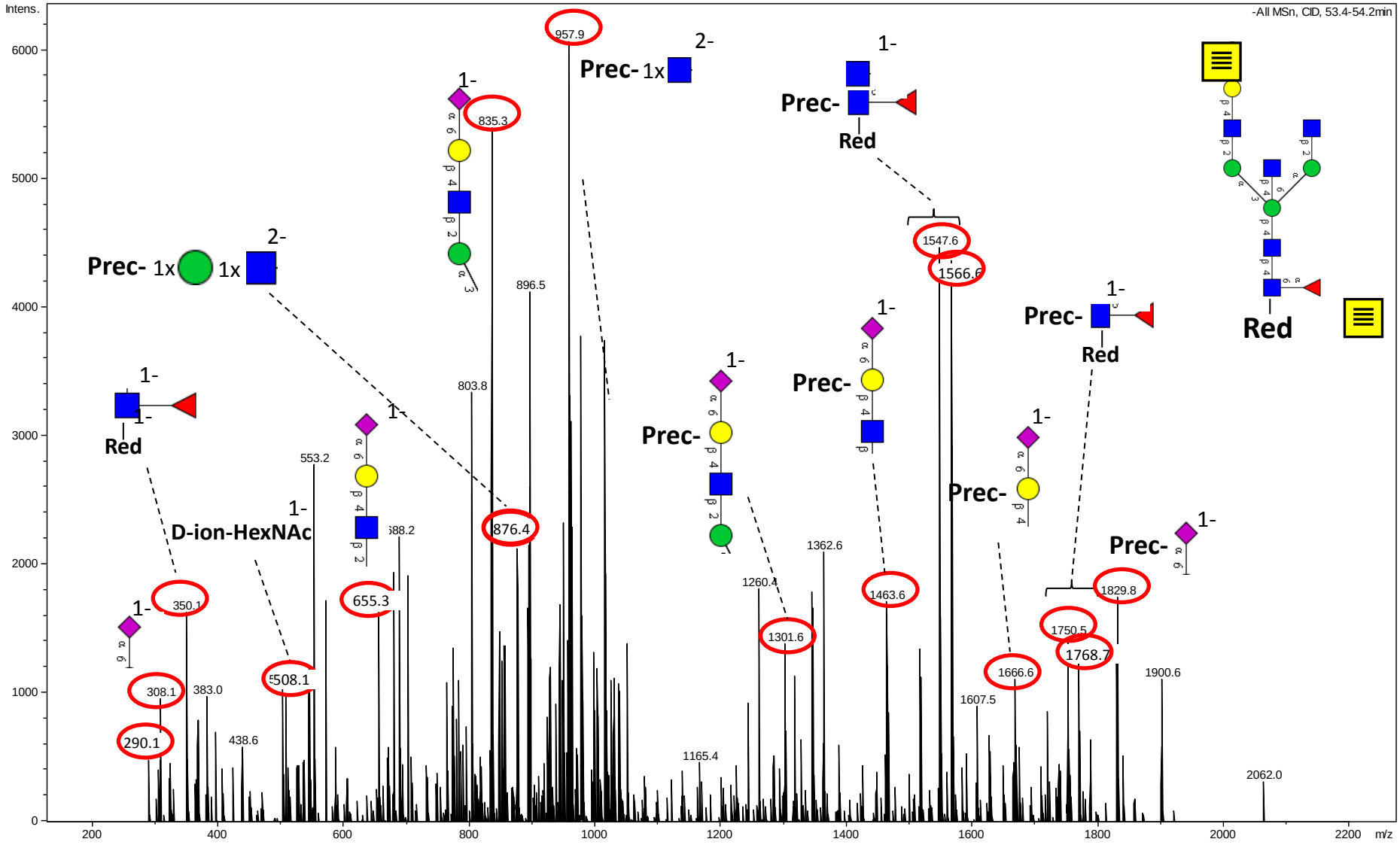
Precursor: m/z = 1059.4 (2-)
$(M-H)^-$ = 2119.8 Da
LC retention time: 48.0 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #38B

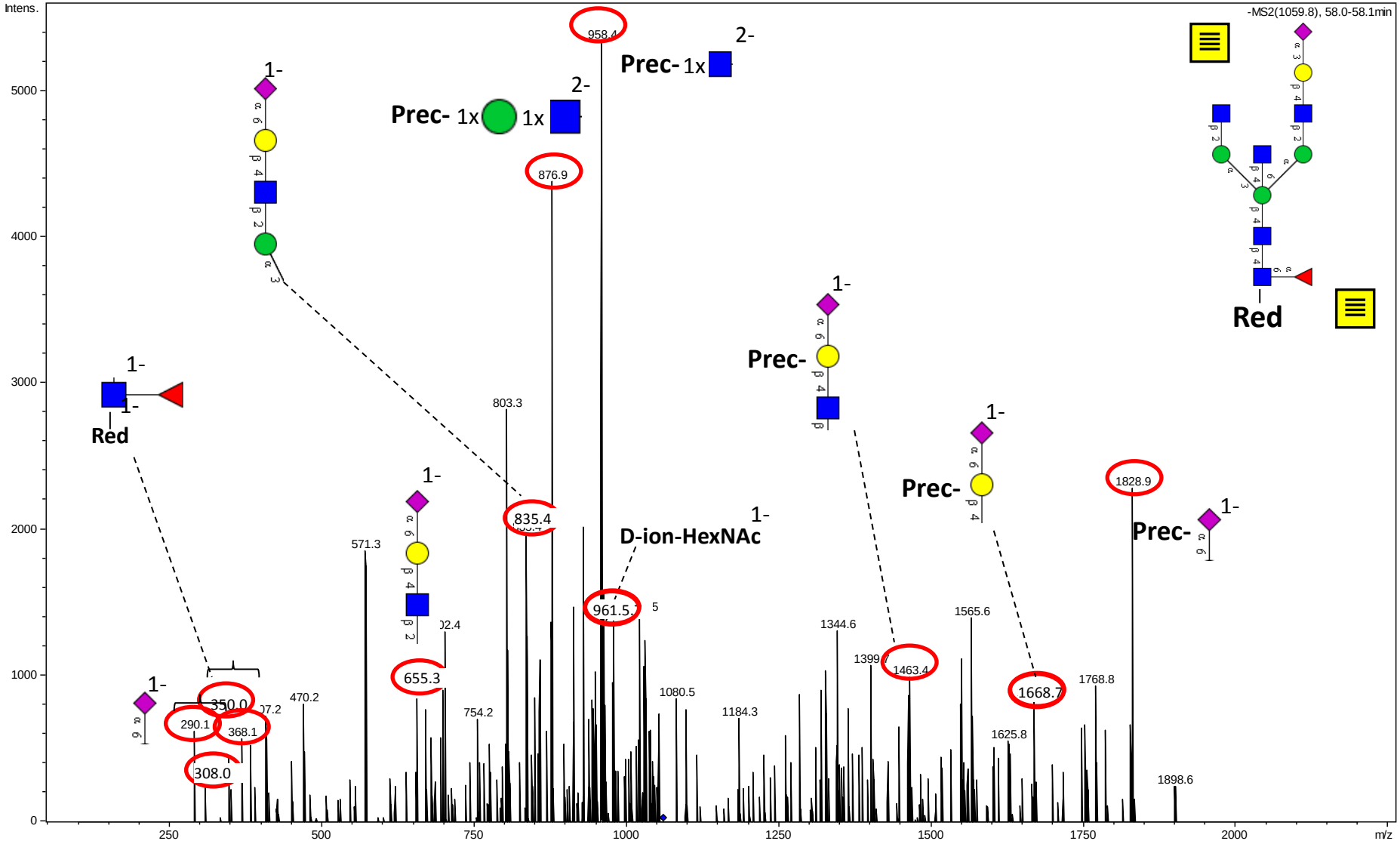
Precursor: m/z = 1059.4 (2-)
$(M-H)^-$ = 2119.8 Da
LC retention time: 53.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #38C

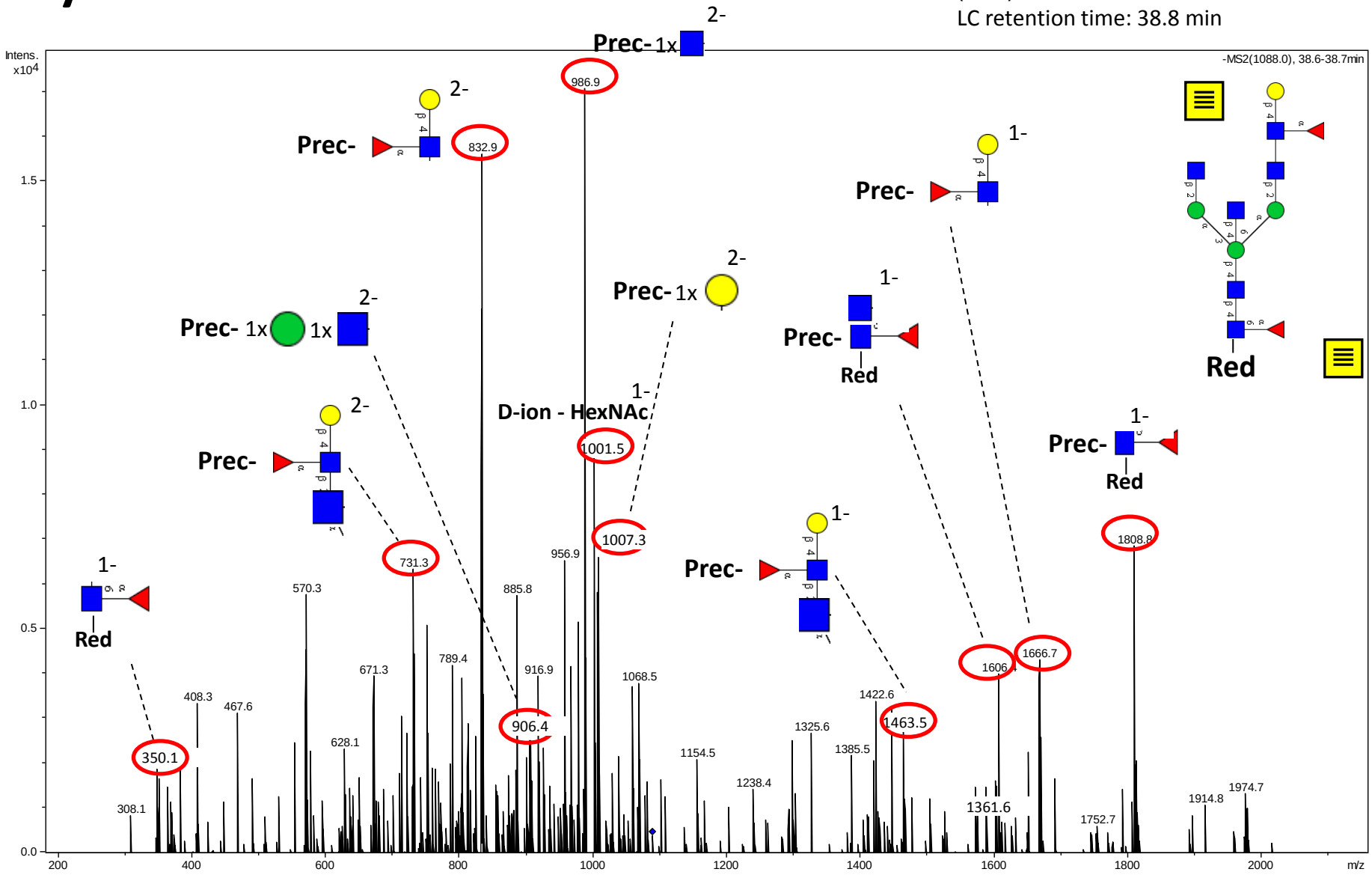
Precursor: m/z = 1059.4 (2-)
$(M-H)^-$ = 2119.8 Da
LC retention time: 58.1 min



No match to MS2 spectrum in UniCarbKB

Glycan #40

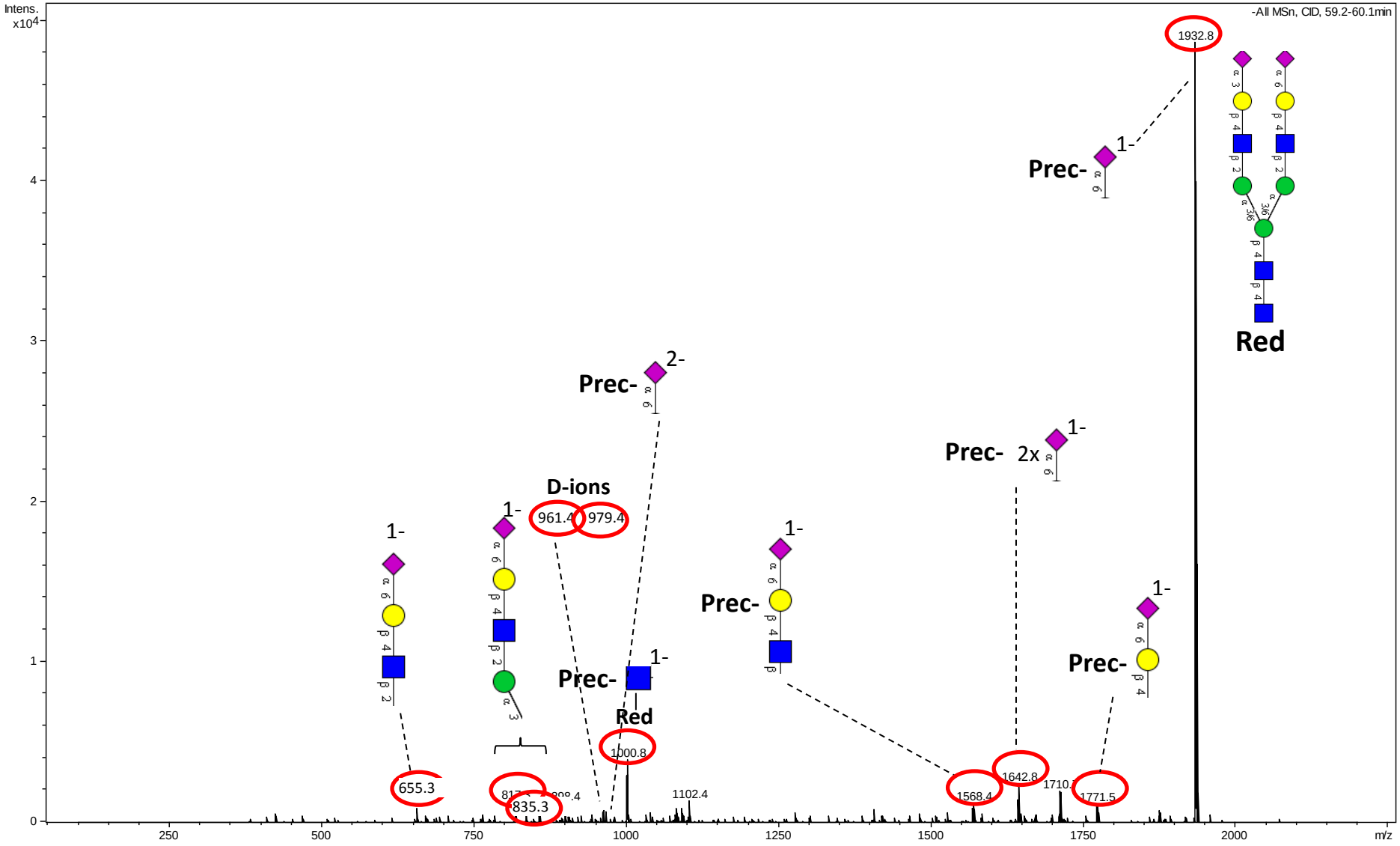
Precursor: m/z = 1088.5 (2-)
$(M-H)^-$ = 2178.0 Da
LC retention time: 38.8 min



No match to MS2 spectrum in UniCarbKB

Glycan #41A

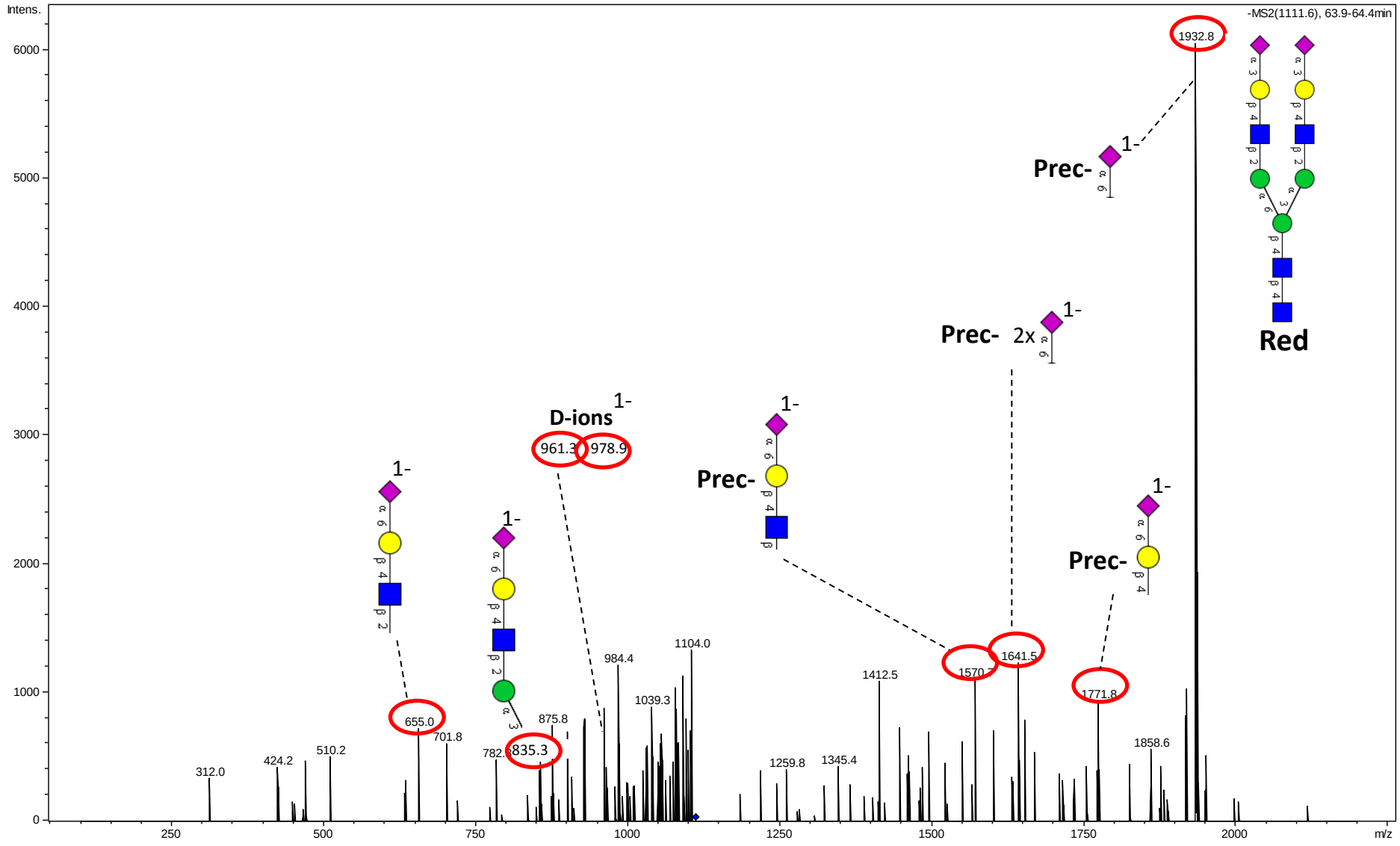
Precursor: m/z = 1111.4 (2-)
$(M-H)^-$ = 2223.8 Da
LC retention time: 59.6 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #41B

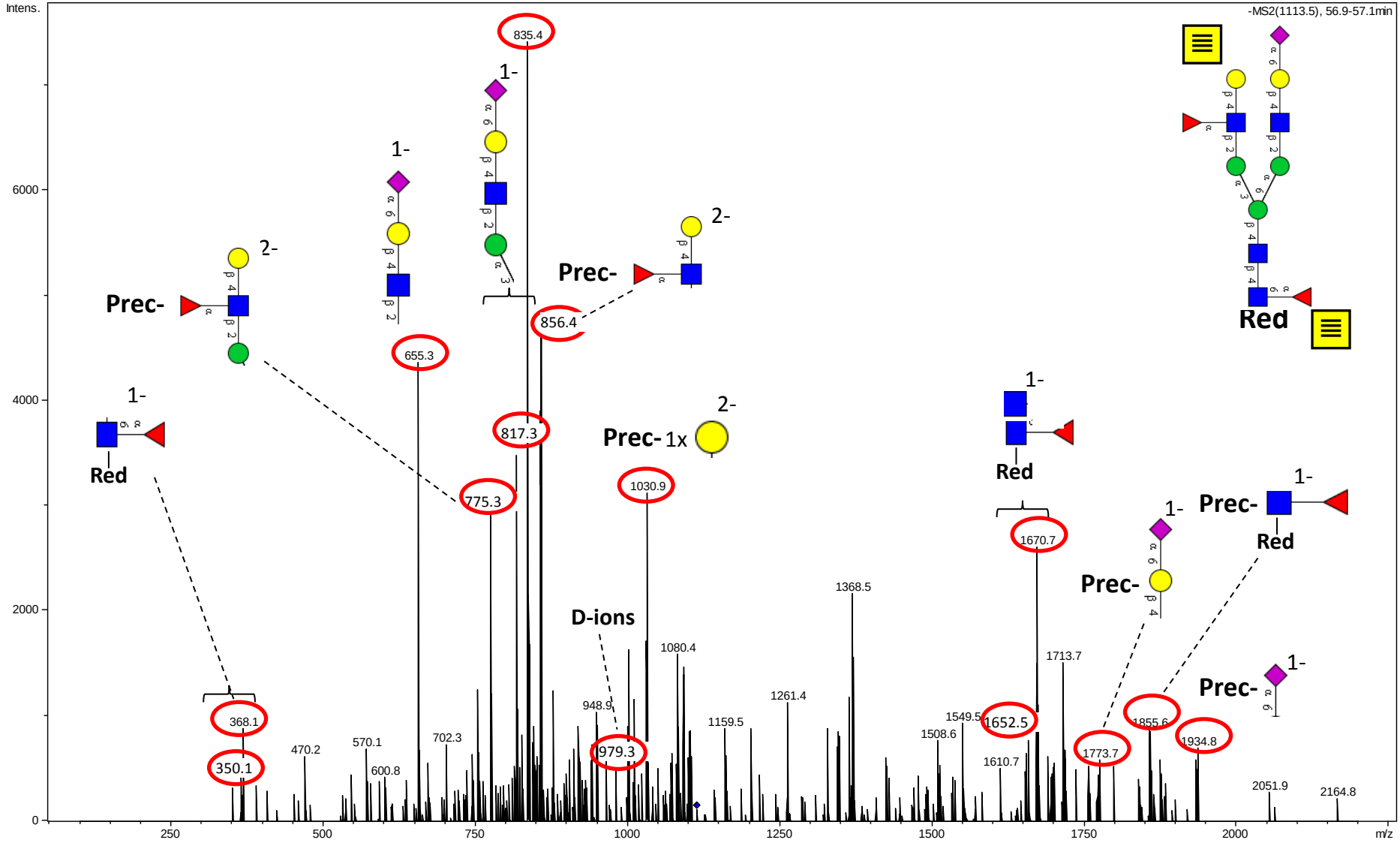
Precursor: m/z = 1111.4 (2-)
$(M-H)^-$ = 2223.8 Da
LC retention time: 64.2 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #42A

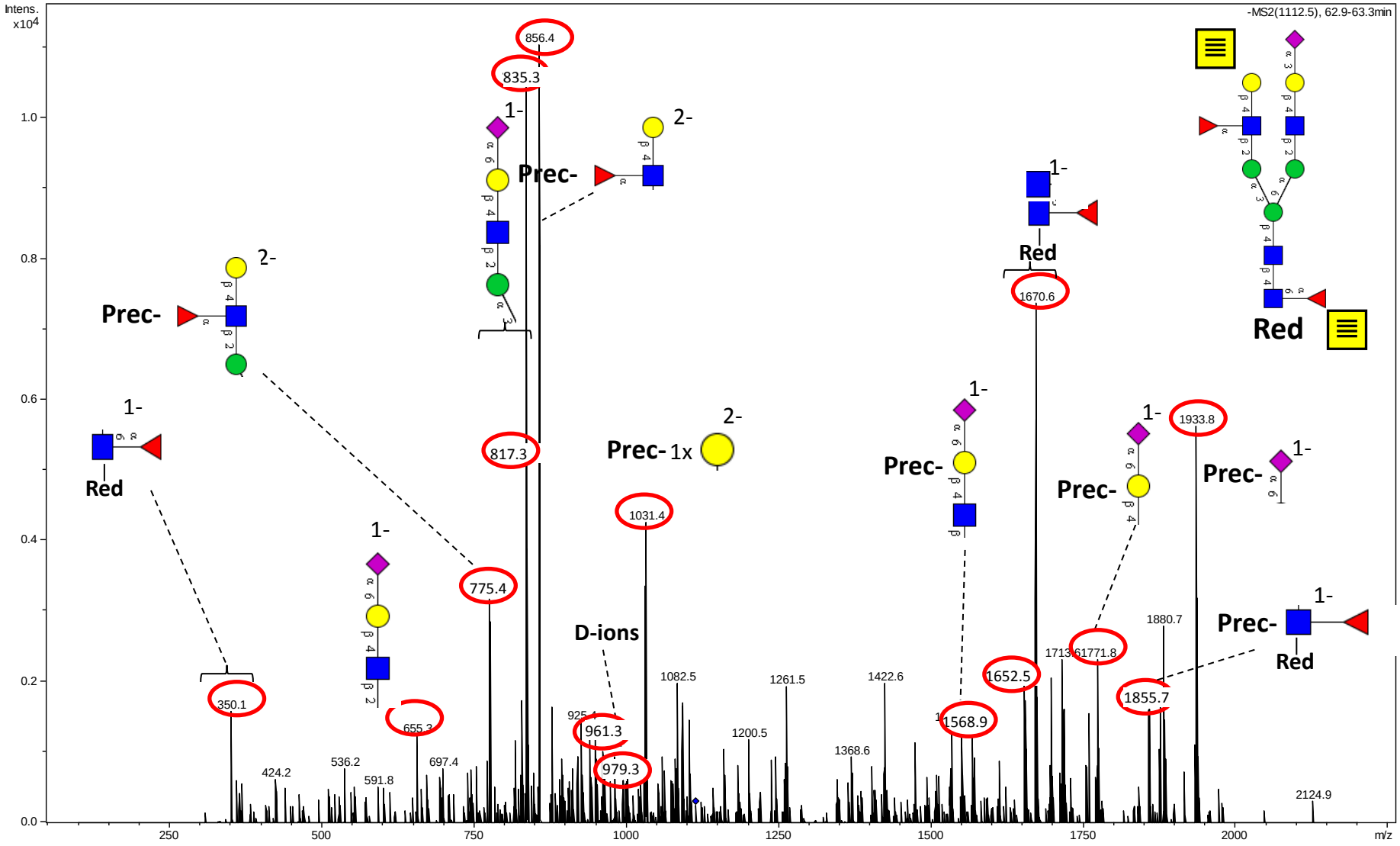
Precursor: m/z =1111.9 (2-)
$(M-H)^-$ = 2224.8 Da
LC retention time: 56.8 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #42B

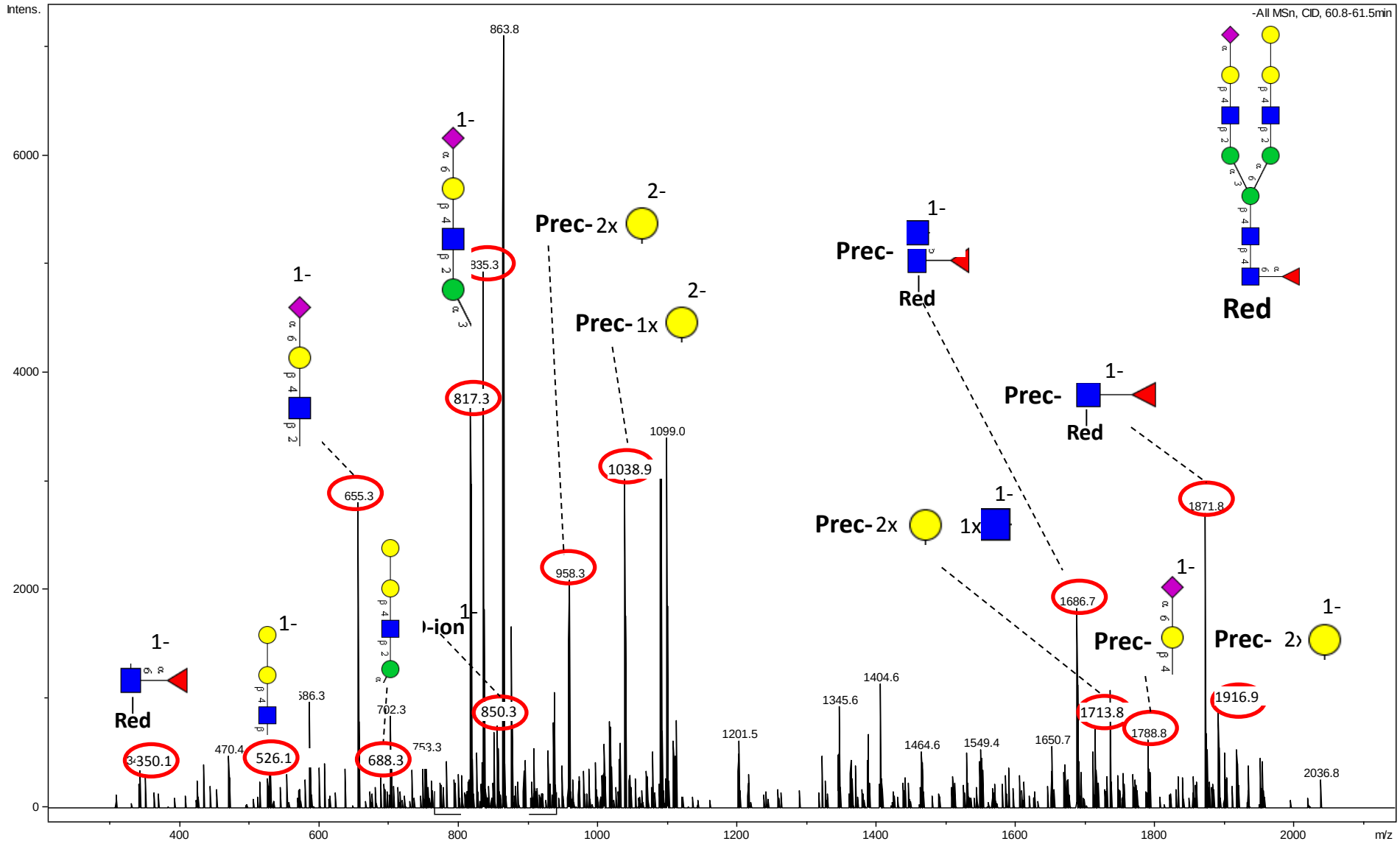
Precursor: m/z =1111.9 (2-)
$(M-H)^-$ = 2224.8 Da
LC retention time: 63.1 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #43A

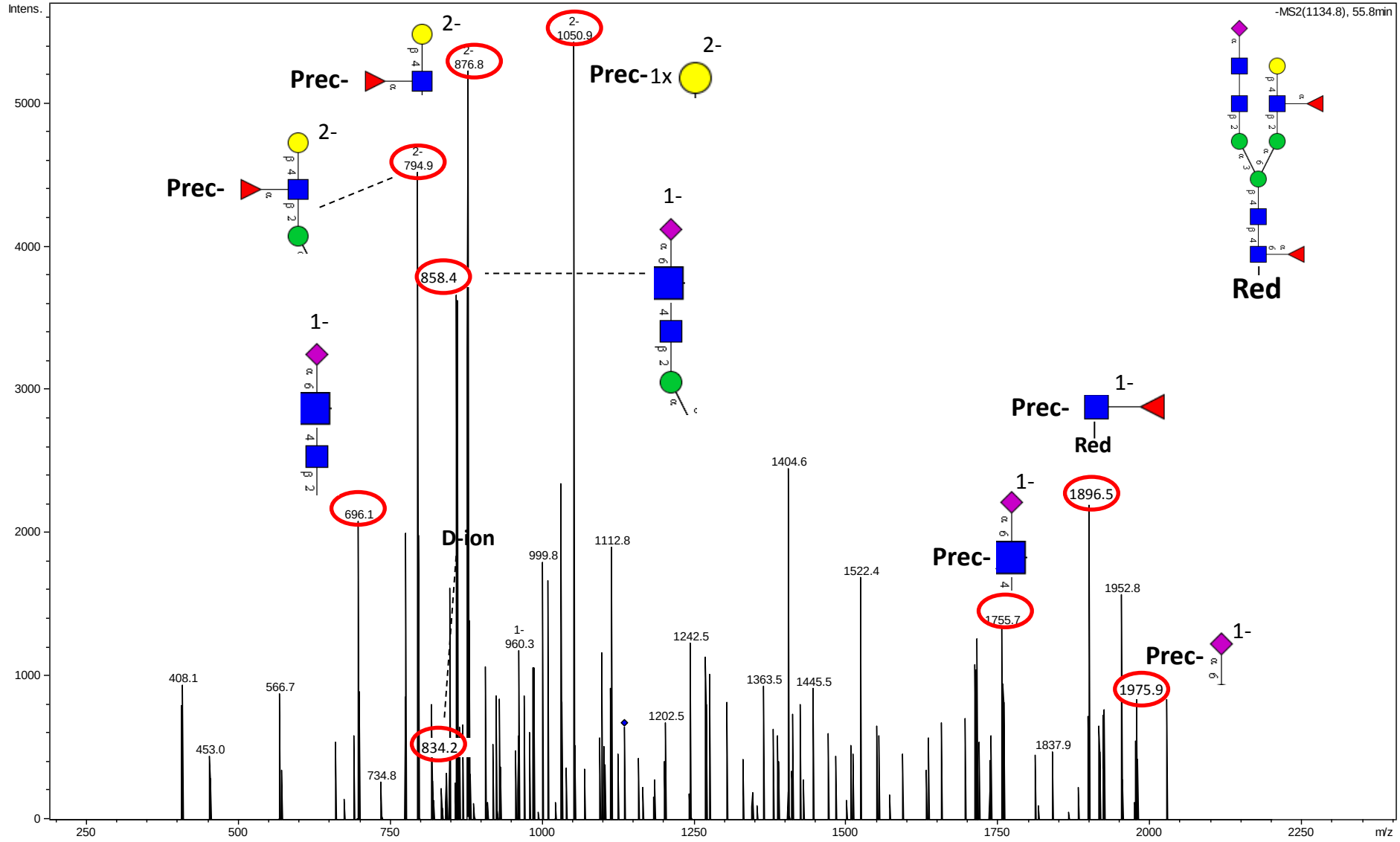
Precursor: m/z =1120.0 (2-)
$(M-H)^-$ = 2241.0 Da
LC retention time: 61.3 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #44

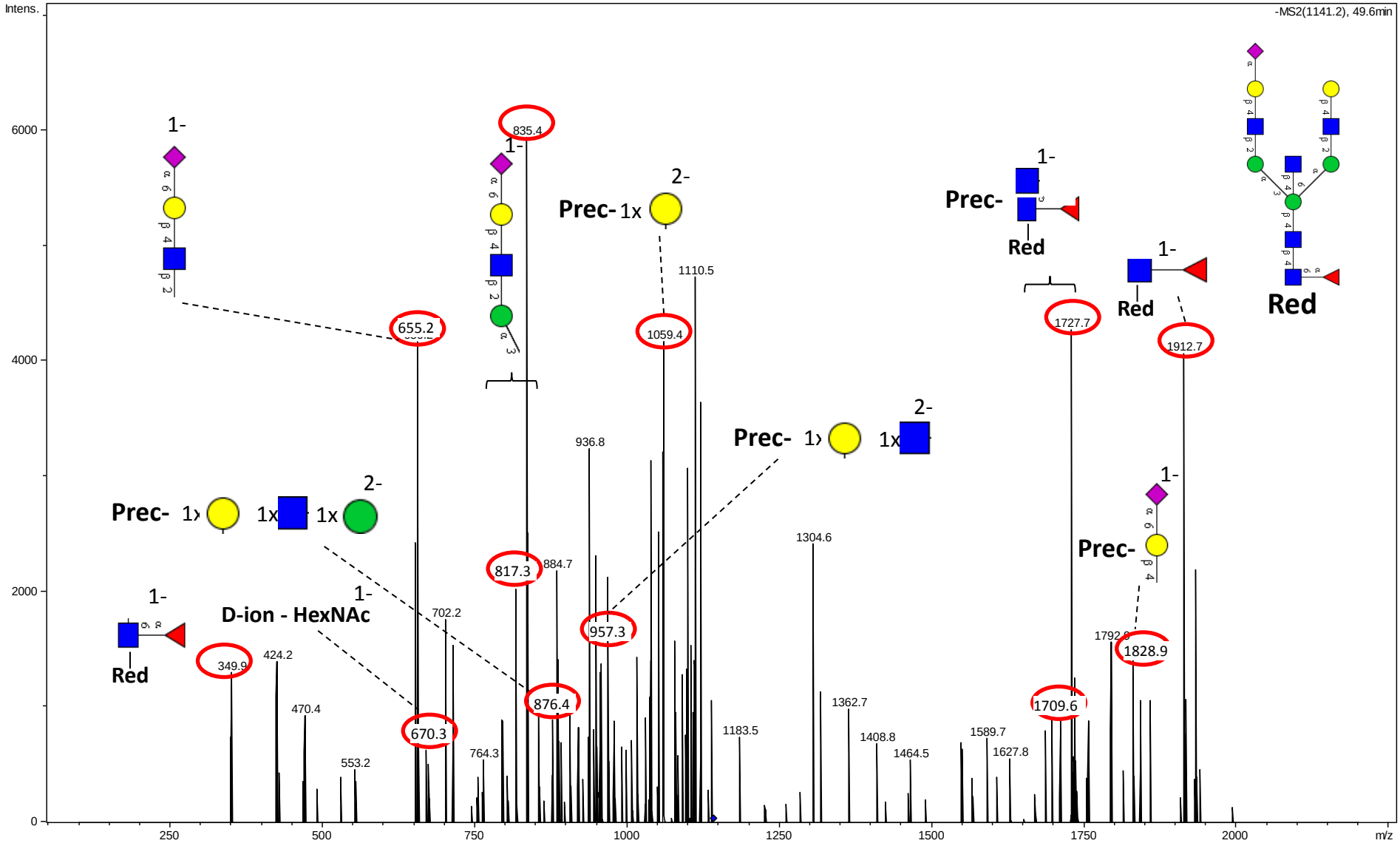
Precursor: m/z = 1132.5 (2-)
$(M-H)^-$ = 2266.0 Da
LC retention time: 55.7 min



No match to MS2 spectrum in UniCarbKB

Glycan #45A

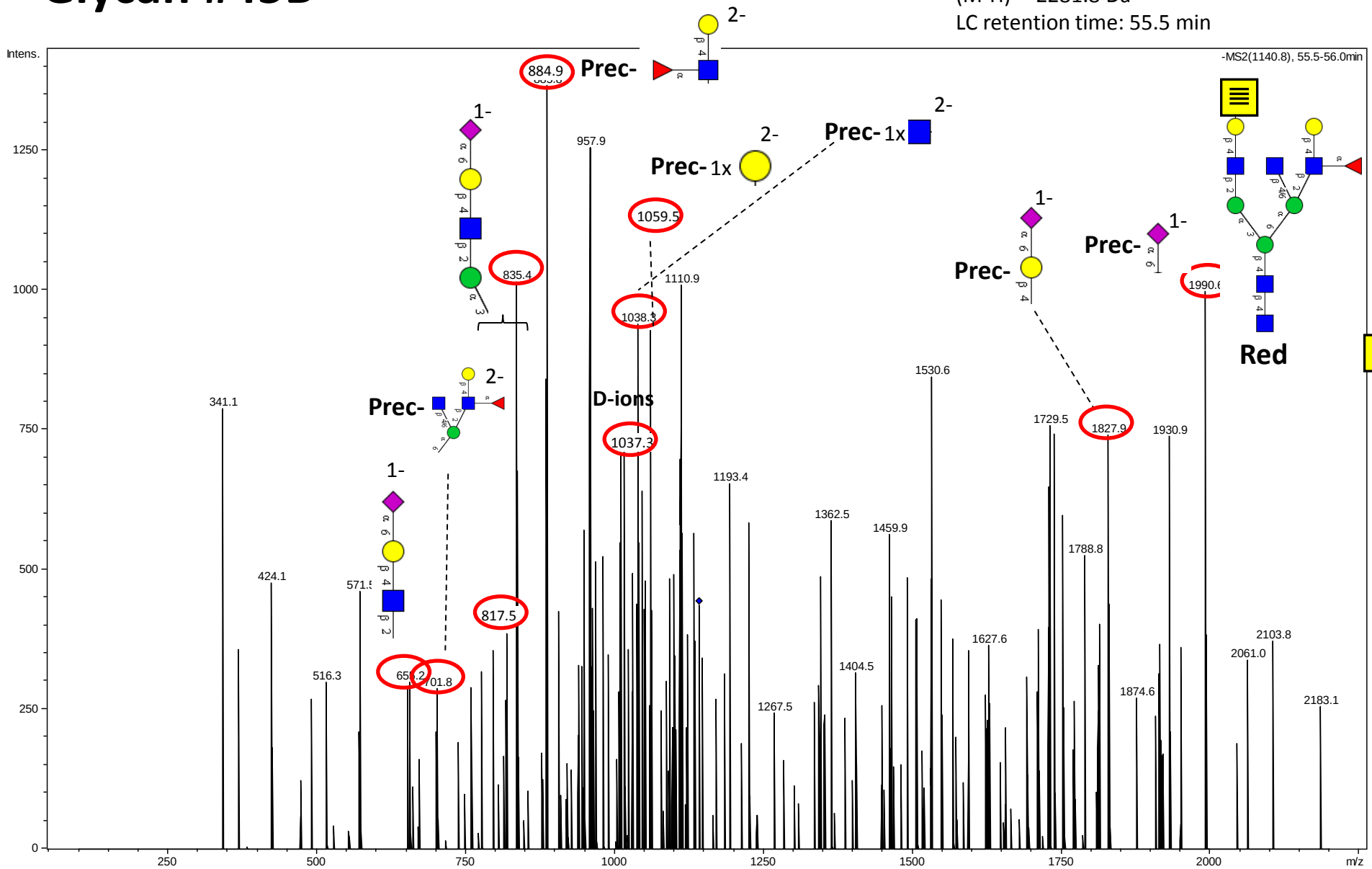
Precursor: m/z =1140.4 (2-)
$(M-H)^-$ = 2281.8 Da
LC retention time: 49.5 min



Positive match to MS2 spectrum in UniCarbKB

Glycan #45B

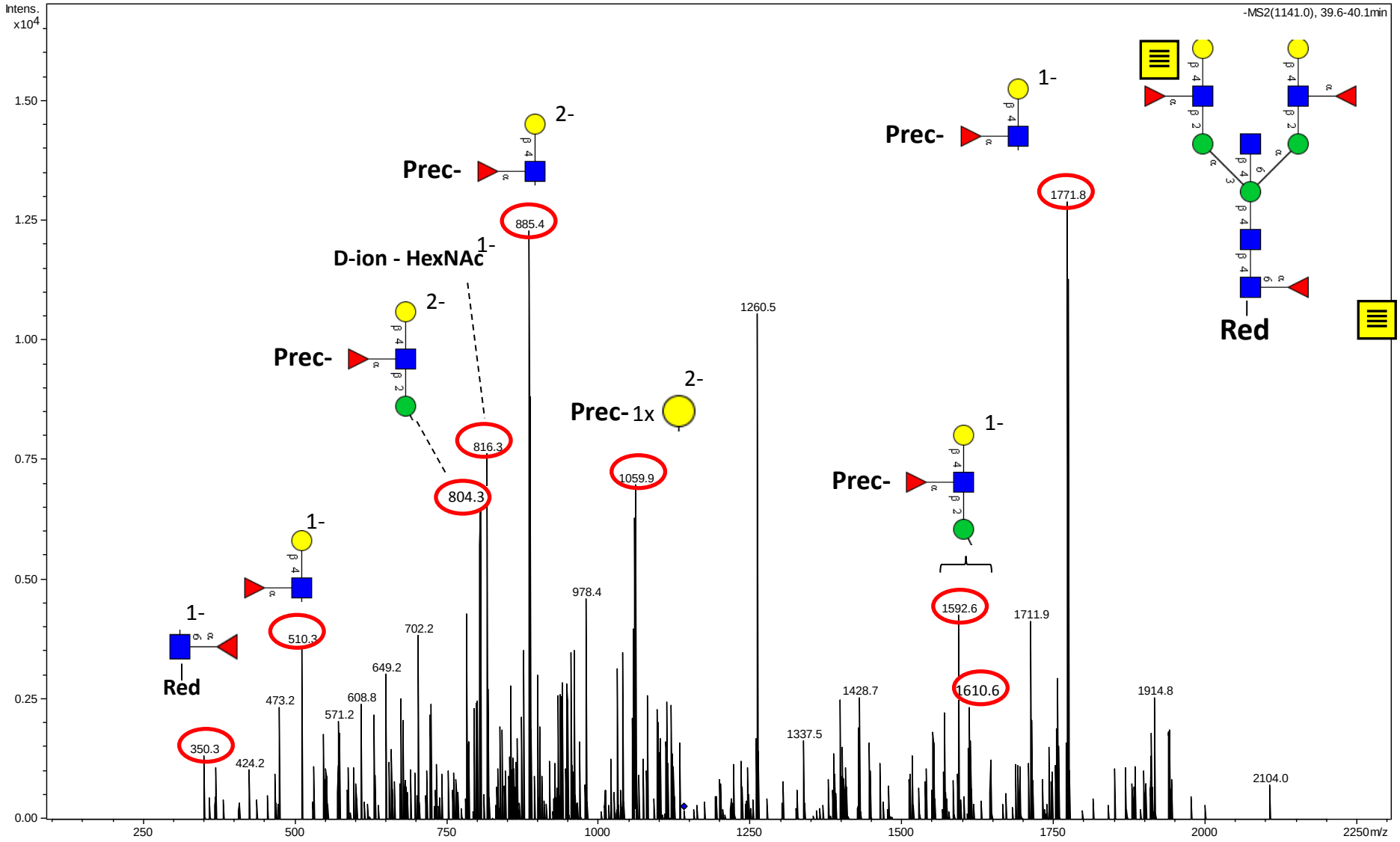
Precursor: m/z =1140.4 (2-)
$(M-H)^-$ = 2281.8 Da
LC retention time: 55.5 min



No match to MS2 spectrum in UniCarbKB

Glycan #46

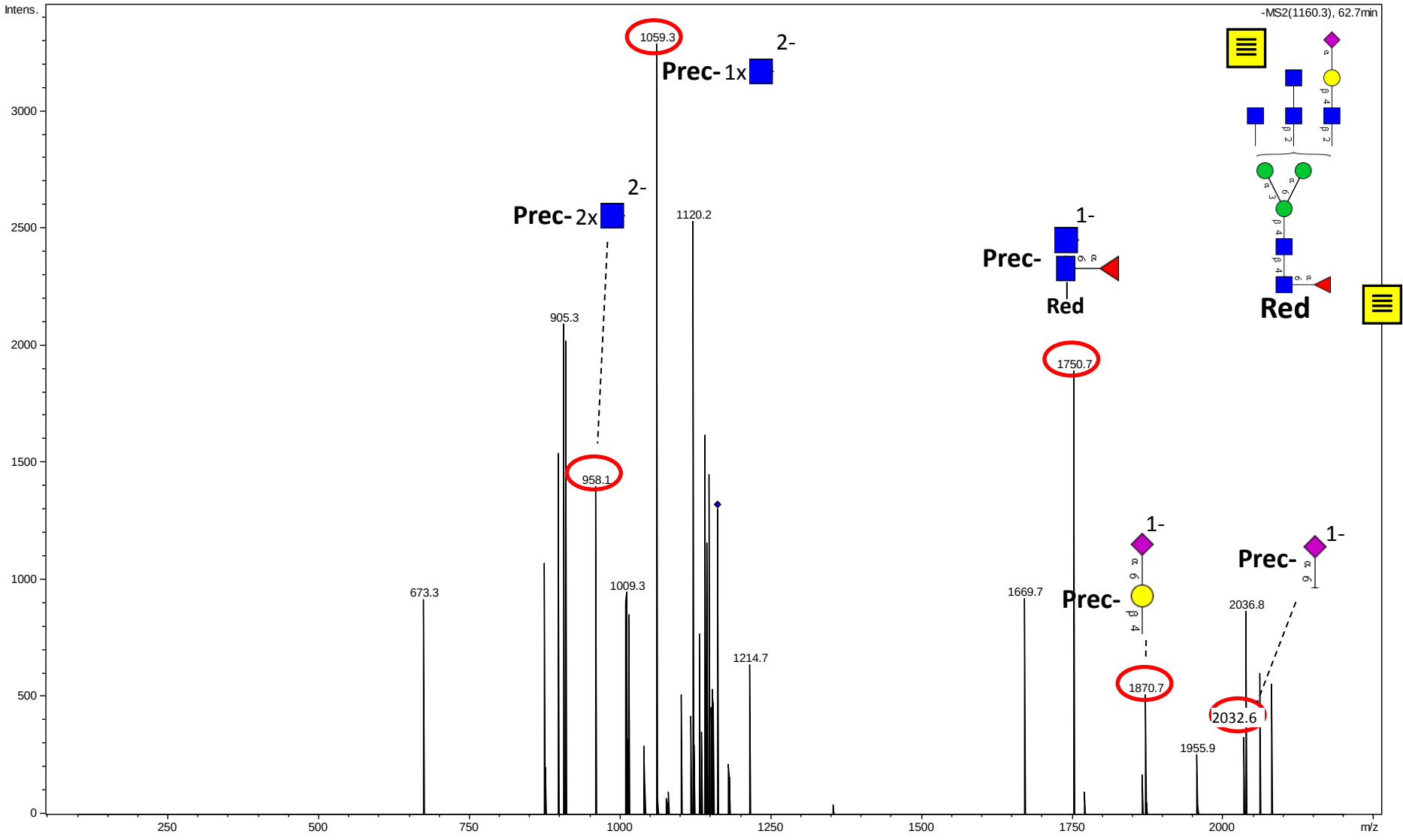
Precursor: m/z = 1141.0 (2-)
$(M-H)^-$ = 2283.0 Da
LC retention time: 39.5 min



No match to MS2 spectrum in UniCarbKB

Glycan #47A

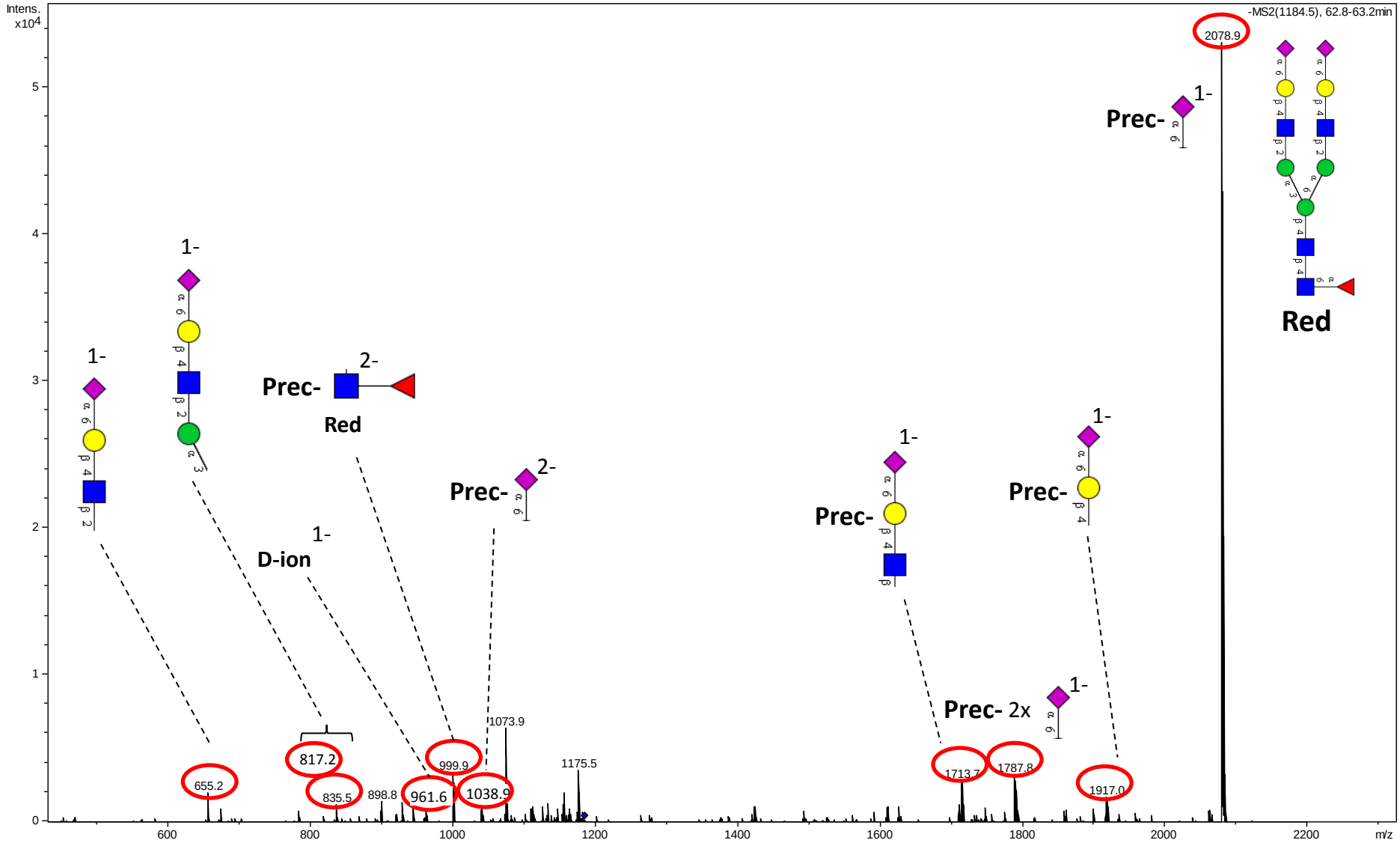
Precursor: m/z =1160.9 (2-)
$(M-H)^-$ = 2322.8 Da
LC retention time: 56.8 min



No match to MS2 spectrum in UniCarbKB

Glycan #48A

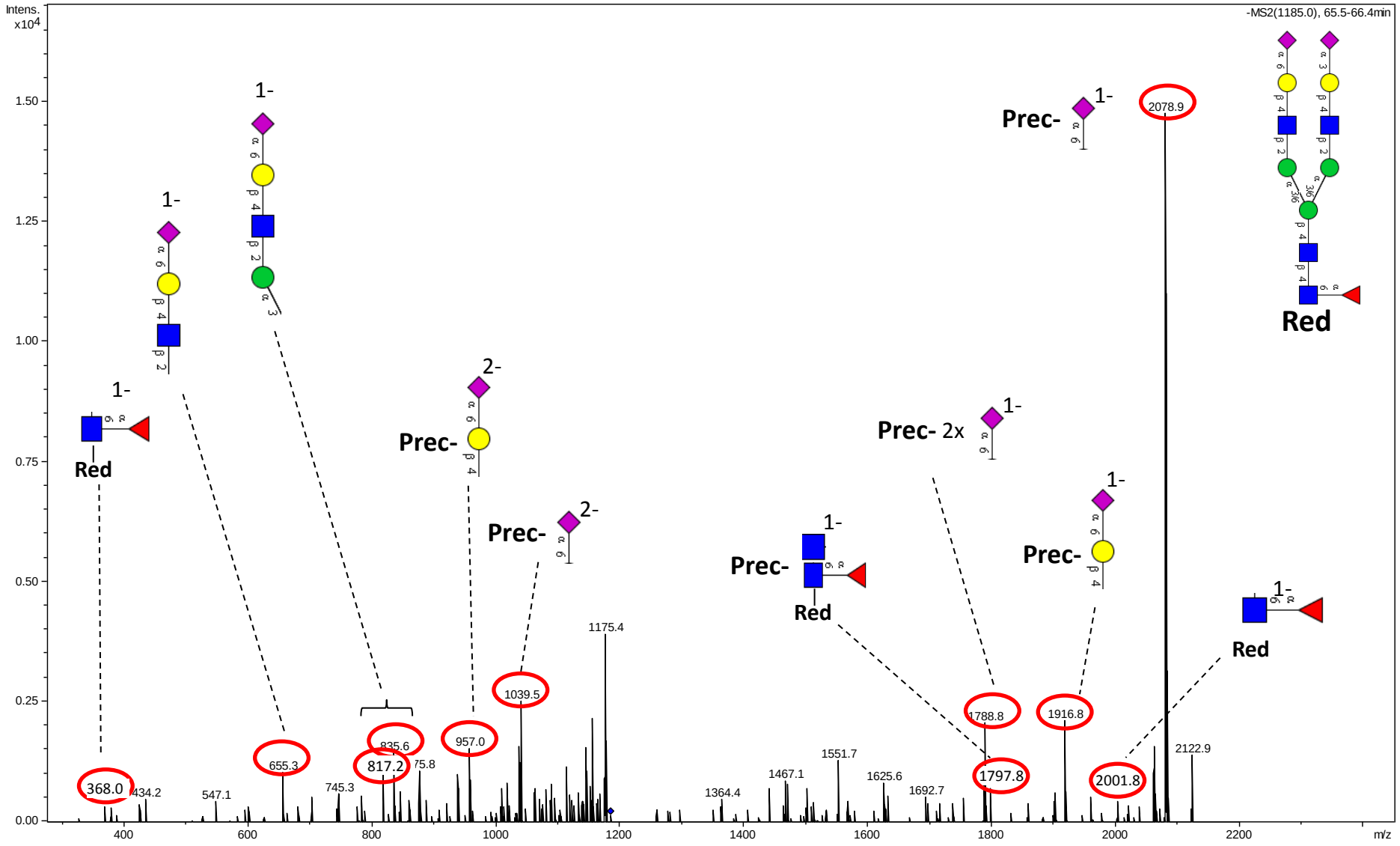
Precursor: m/z =1184.5 (2-)
$(M-H)^-$ = 2370.0 Da
LC retention time: 62.9 min



No match to MS2 spectrum in UniCarbKB

Glycan #48B

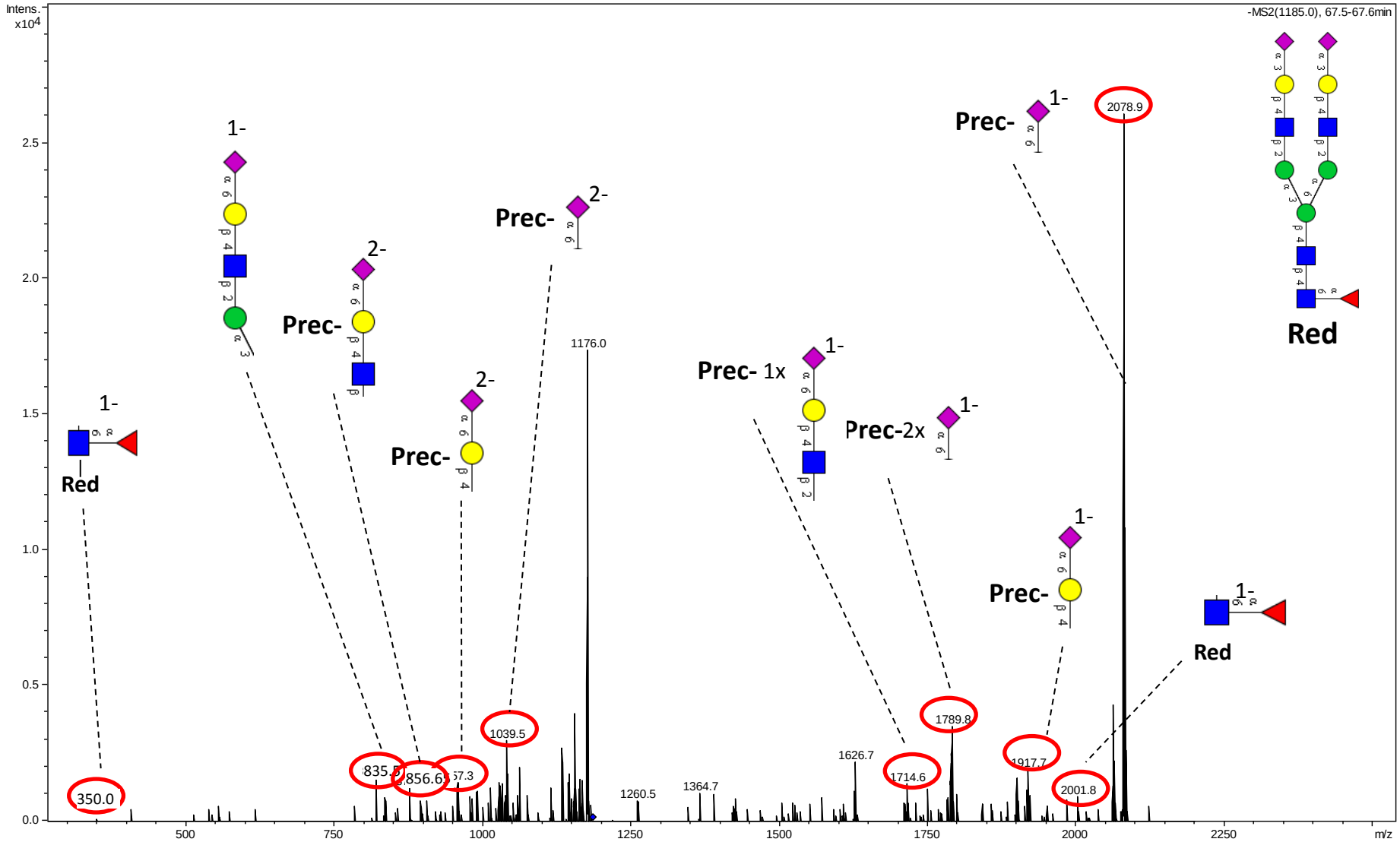
Precursor: m/z =1184.5 (2-)
$(M-H)^-$ = 2370.0 Da
LC retention time: 65.9 min



No match to MS2 spectrum in UniCarbKB

Glycan #48C

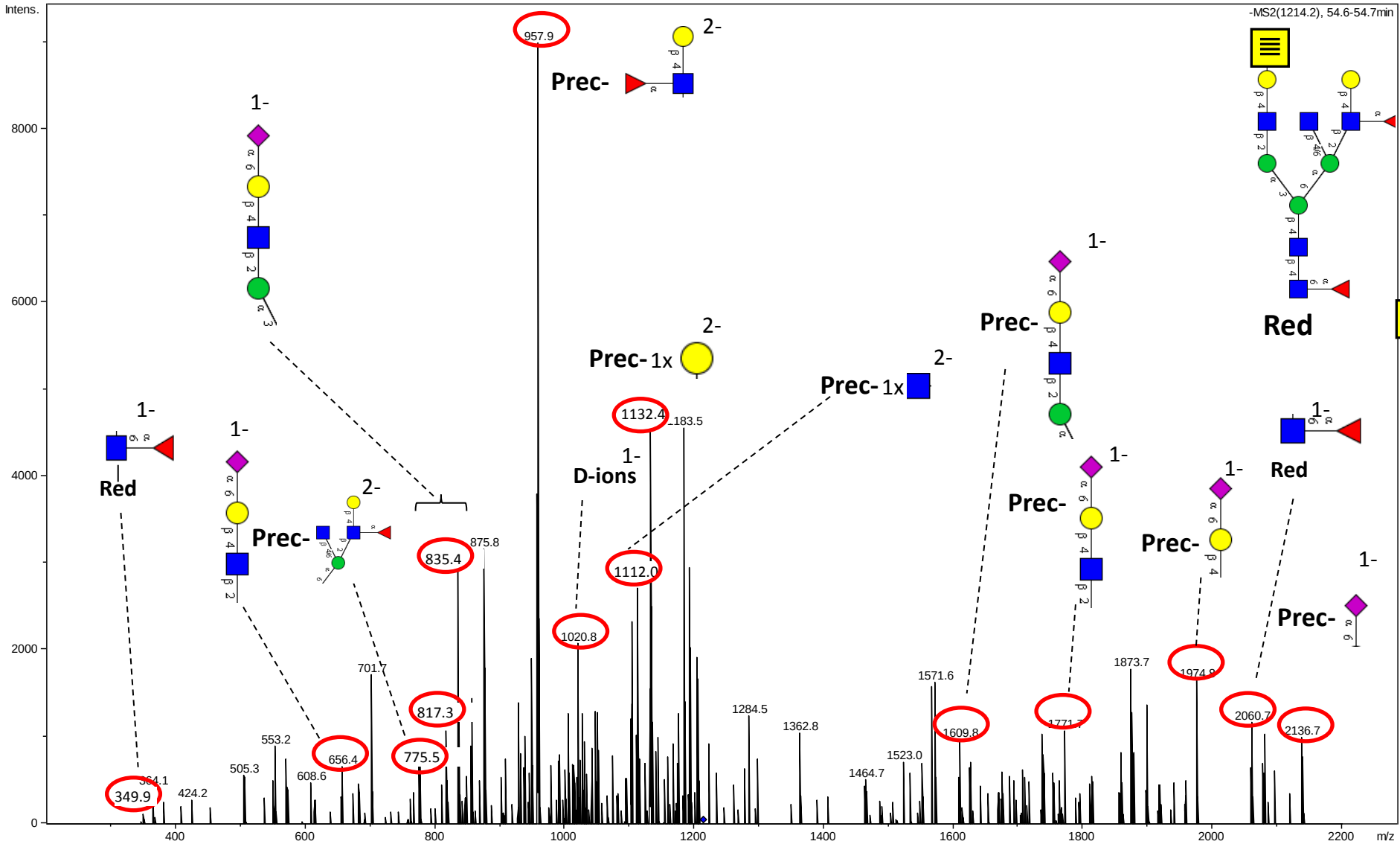
Precursor: m/z =1184.5 (2-)
$(M-H)^-$ = 2370.0 Da
LC retention time: 67.5 min



No match to MS2 spectrum in UniCarbKB

Glycan #49A

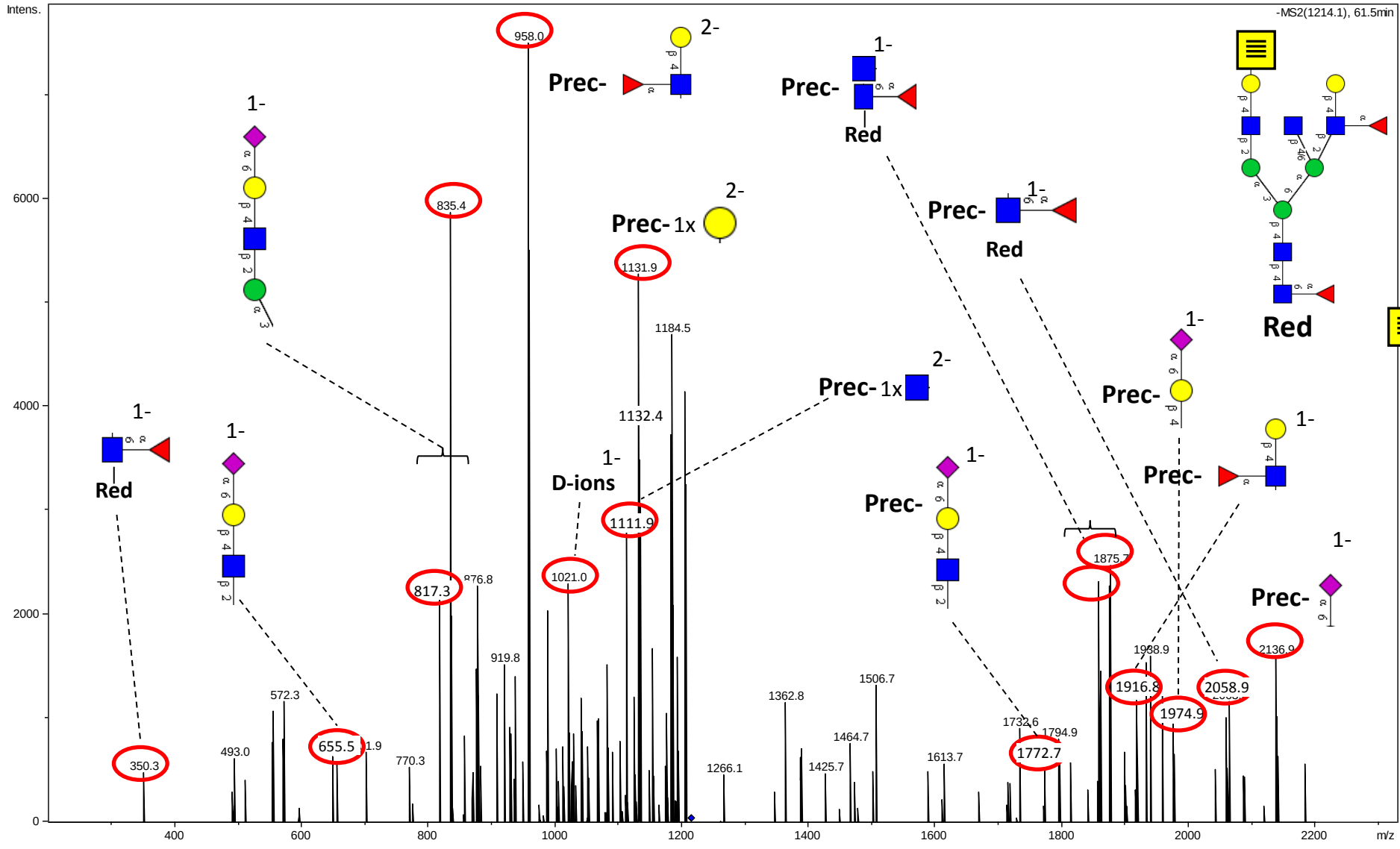
Precursor: m/z =1213.5 (2-)
$(M-H)^-$ = 2428.0 Da
LC retention time: 54.5 min



No match to MS2 spectrum in UniCarbKB

Glycan #49B

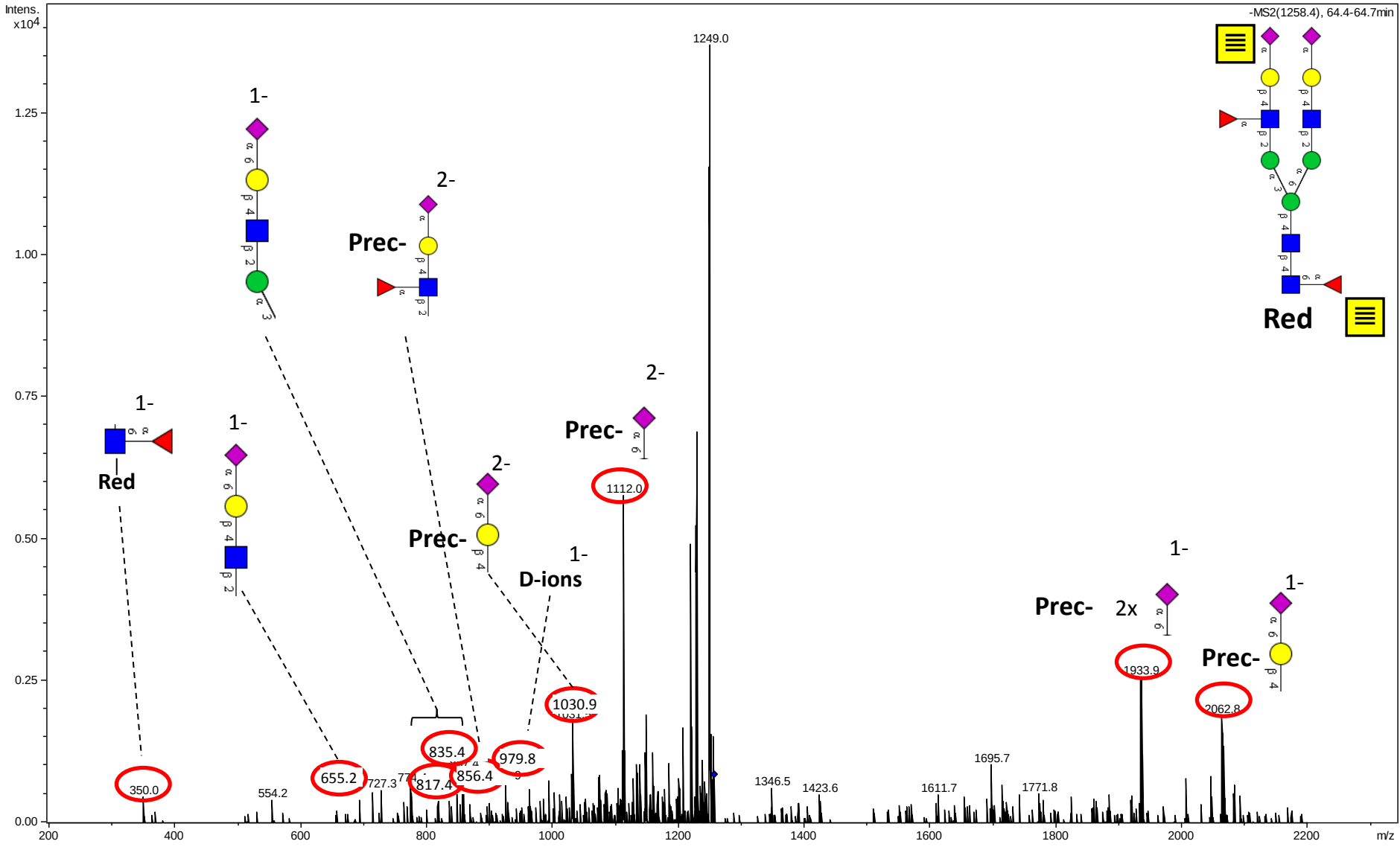
Precursor: m/z =1213.5 (2-)
$(M-H)^-$ = 2428.0 Da
LC retention time: 61.0 min



No match to MS2 spectrum in UniCarbKB

Glycan #50

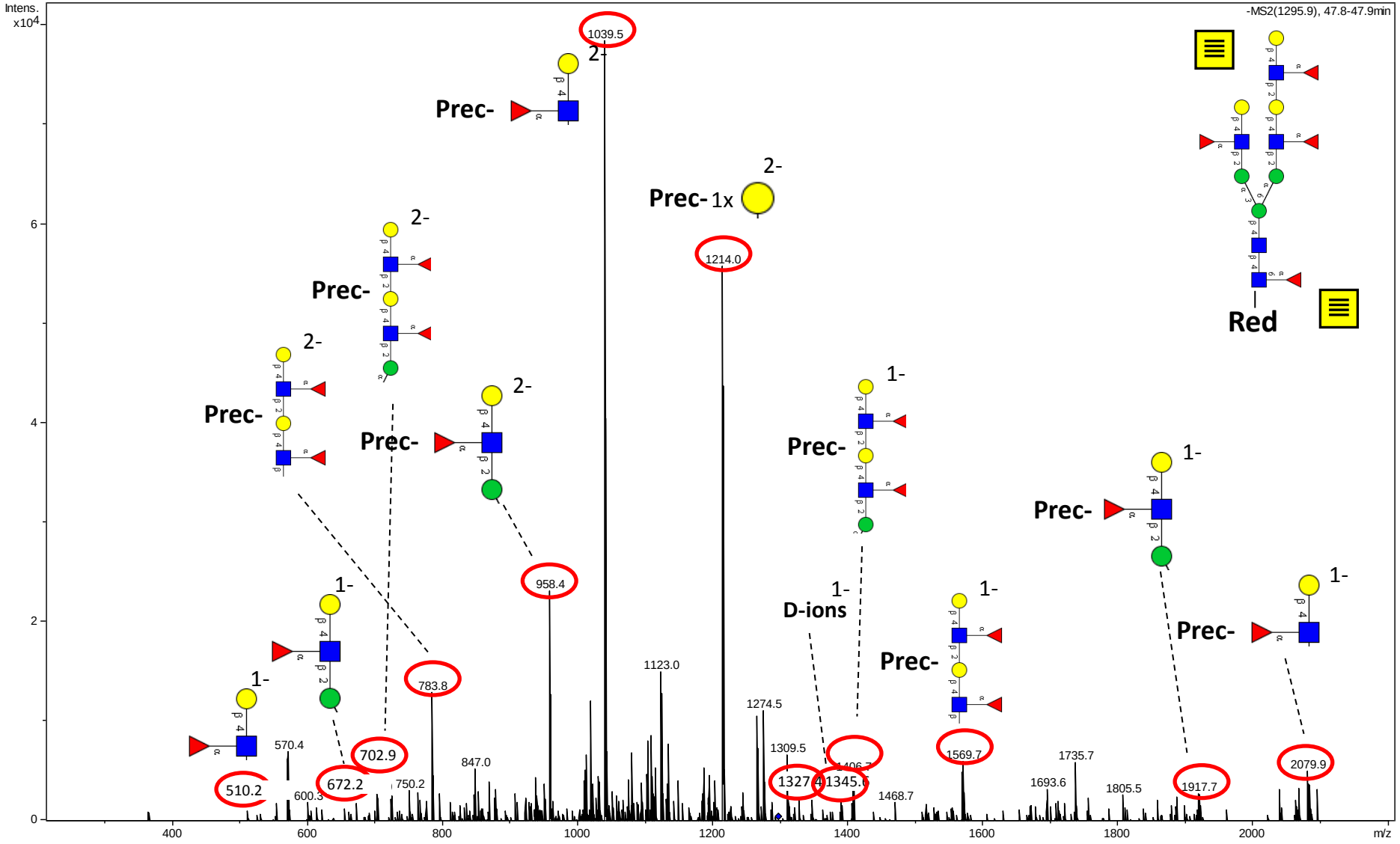
Precursor: m/z =1257.5 (2-)
$(M-H)^-$ = 2515.9 Da
LC retention time: 64.5 min



No match to MS2 spectrum in UniCarbKB

Glycan #51

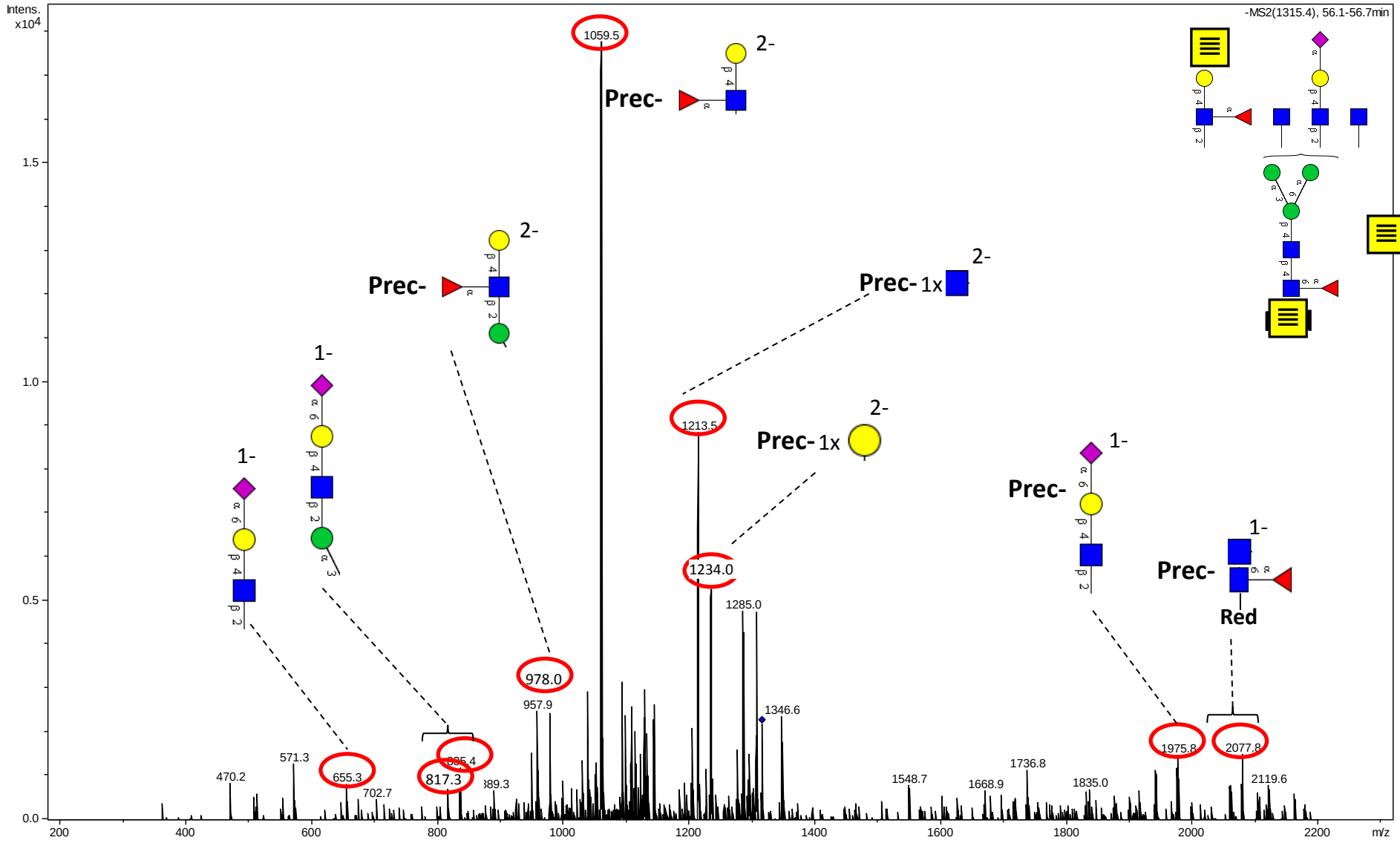
Precursor: m/z = 1295.0 (2-)
$(M-H)^-$ = 2591.0 Da
LC retention time: 47.8 min



No match to MS2 spectrum in UniCarbKB

Glycan #52

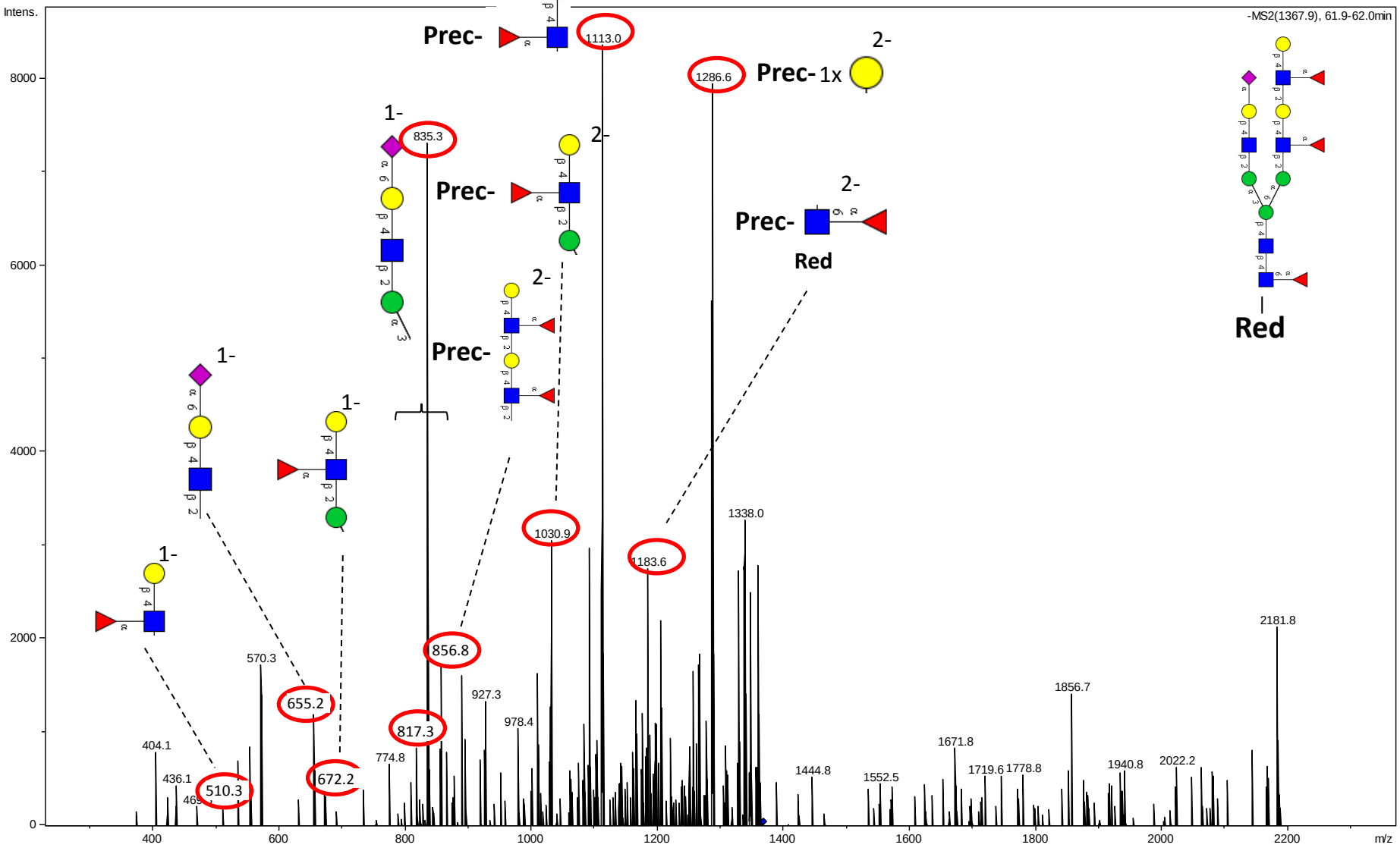
Precursor: m/z =1315.1 (2-)
$(M-H)^-$ = 2631.2 Da
LC retention time: 56.4 min



No match to MS2 spectrum in UniCarbKB

Glycan #53

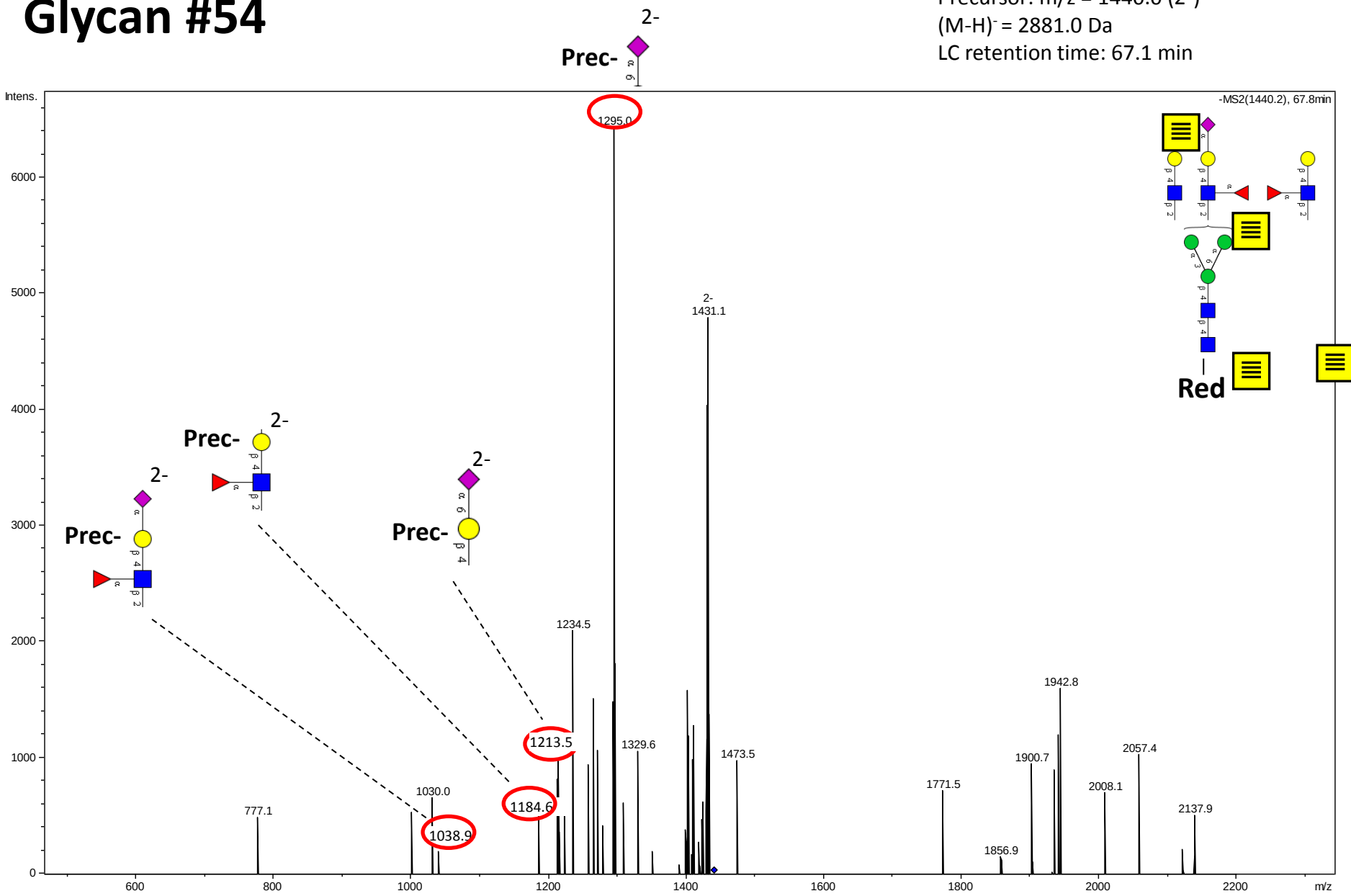
Precursor: m/z = 1367.5 (2-)
$(M-H)^-$ = 2736.0 Da
LC retention time: 62.3 min



No match to MS2 spectrum in UniCarbKB

Glycan #54

Precursor: m/z = 1440.0 (2-)
$(M-H)^-$ = 2881.0 Da
LC retention time: 67.1 min



No match to MS2 spectrum in UniCarbKB