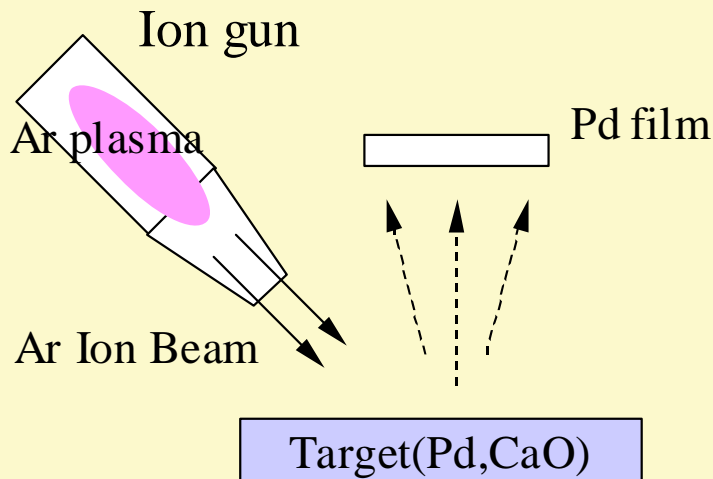
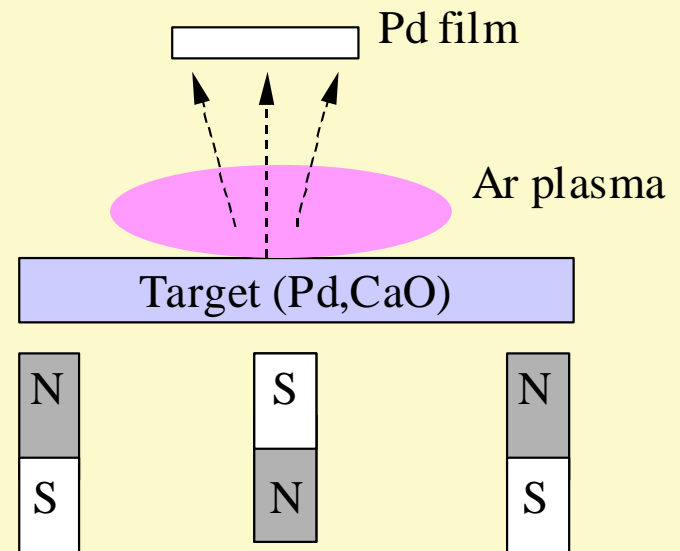


# Consideration on the Role of CaO

## Ion Beam Sputtering

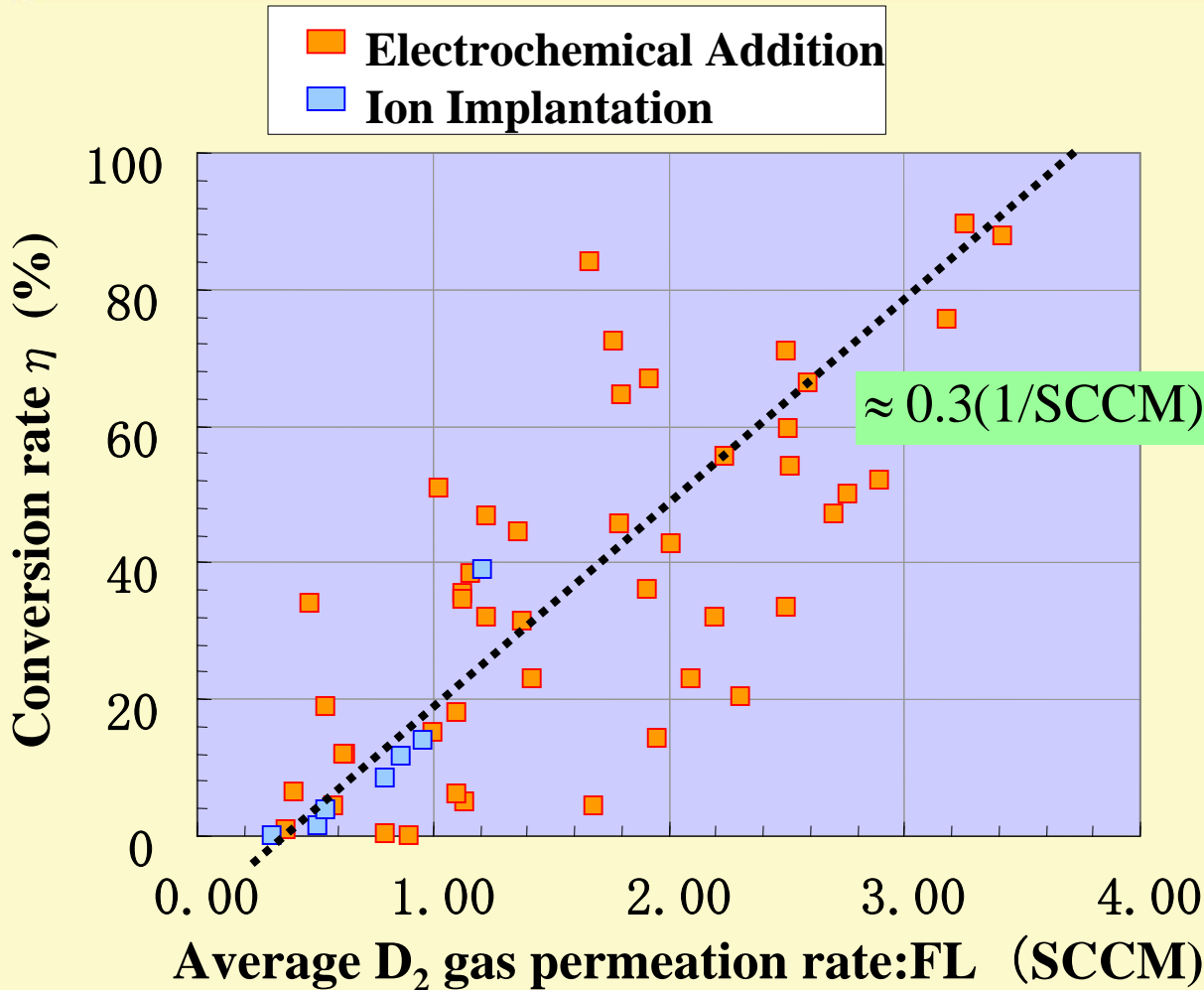


## Magnetron Sputtering



Both magnetron sputtering and ion beam sputtering methods gave positive results.

# Correlation between D<sub>2</sub> Permeation and Conversion Rate



$$\eta = \frac{N_{Pr}}{N_{Cs}} \times 100\%$$

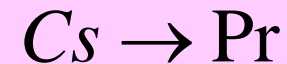
$$= \frac{N_{Pr}}{N'_{Cs} + N_{Pr}} \times 100\%$$

$\eta$  : conversion rate(%)

$N_{Pr}$  : detected Pr (ng)

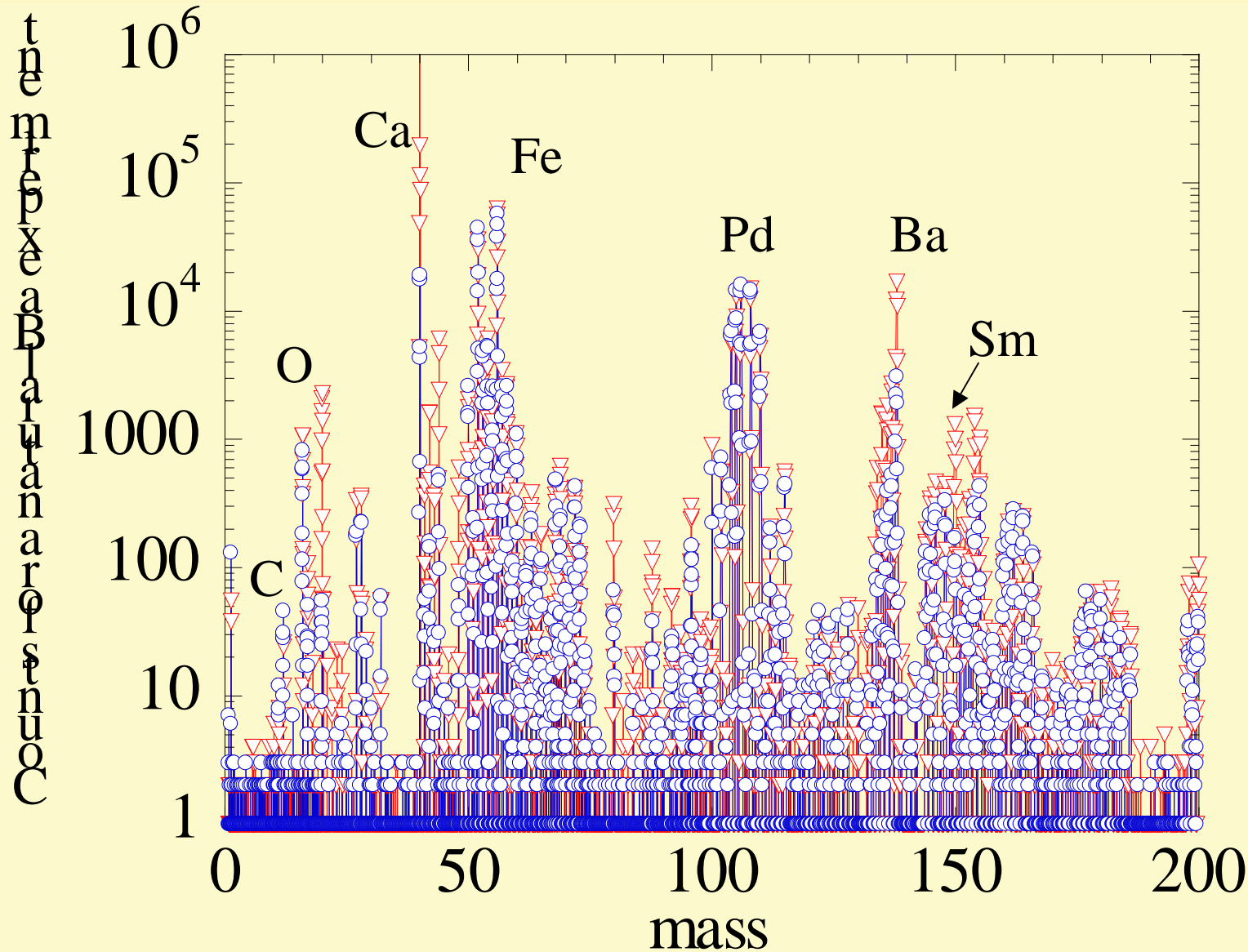
$N_{Cs}$  : given Cs (ng)

$N'_{Cs}$  : detected Cs after  
an experiment (ng)

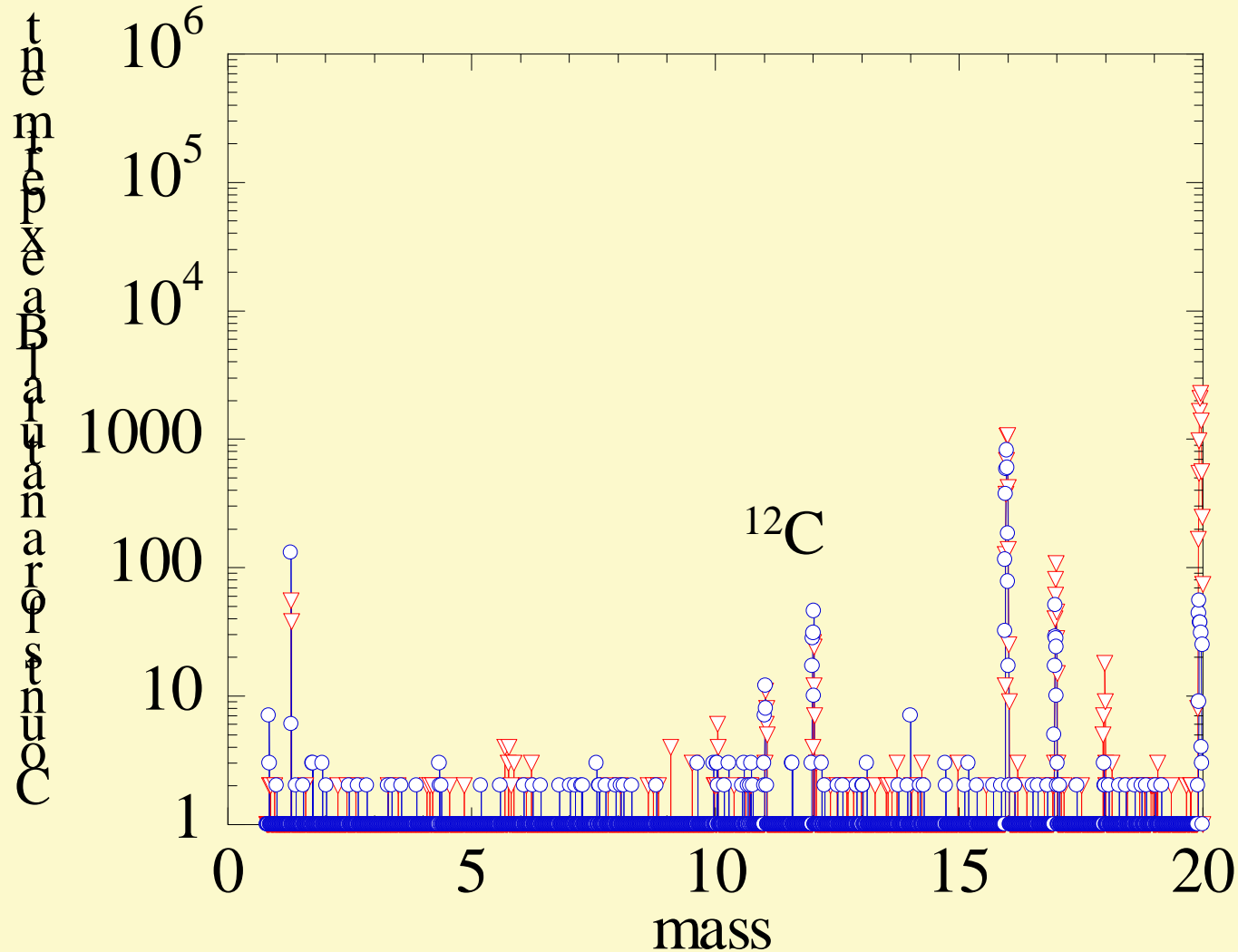


**Positive Correlation between D<sub>2</sub> permeation and Conversion Rate**

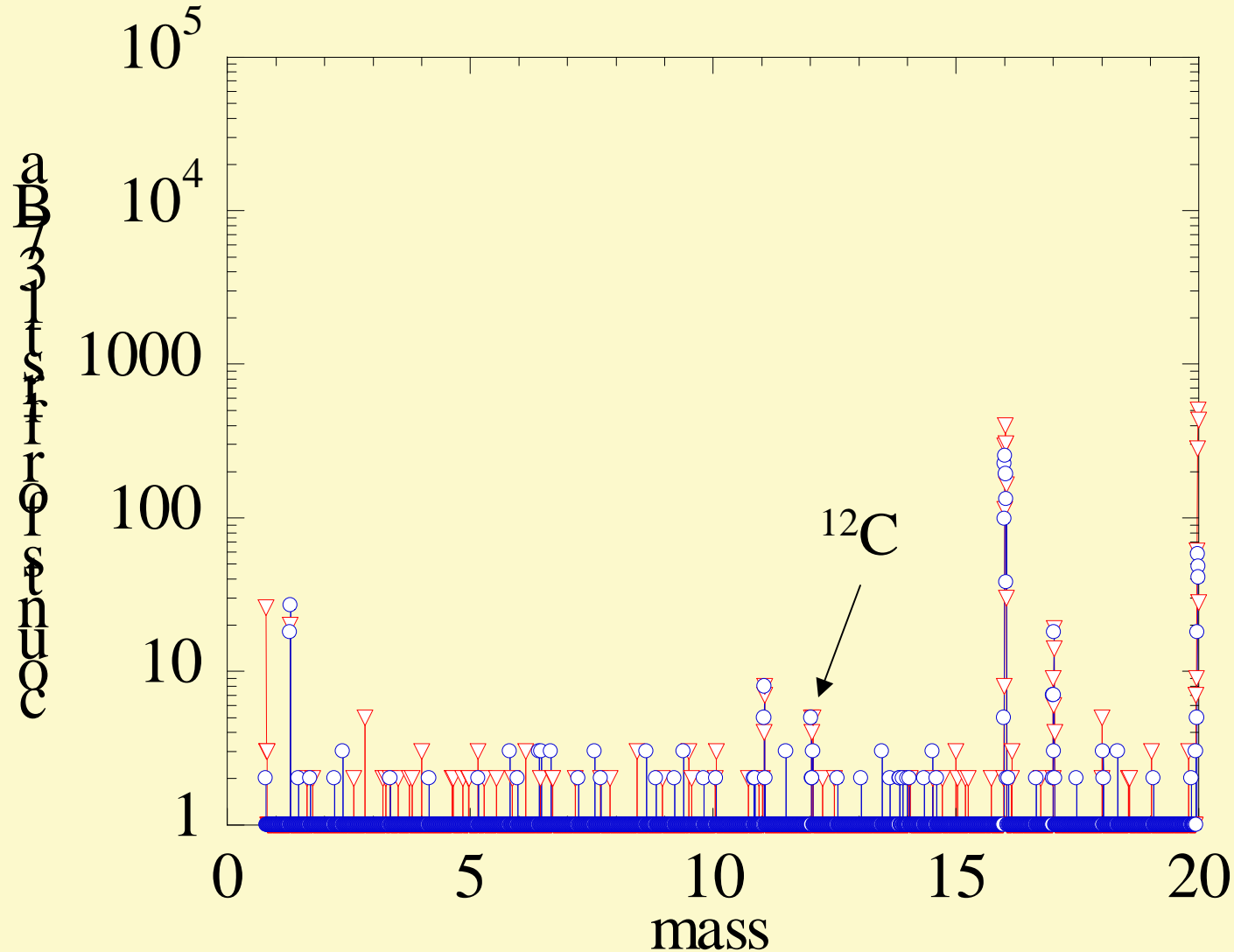
# Full SIMS Spectra for a Natural Ba Experiment



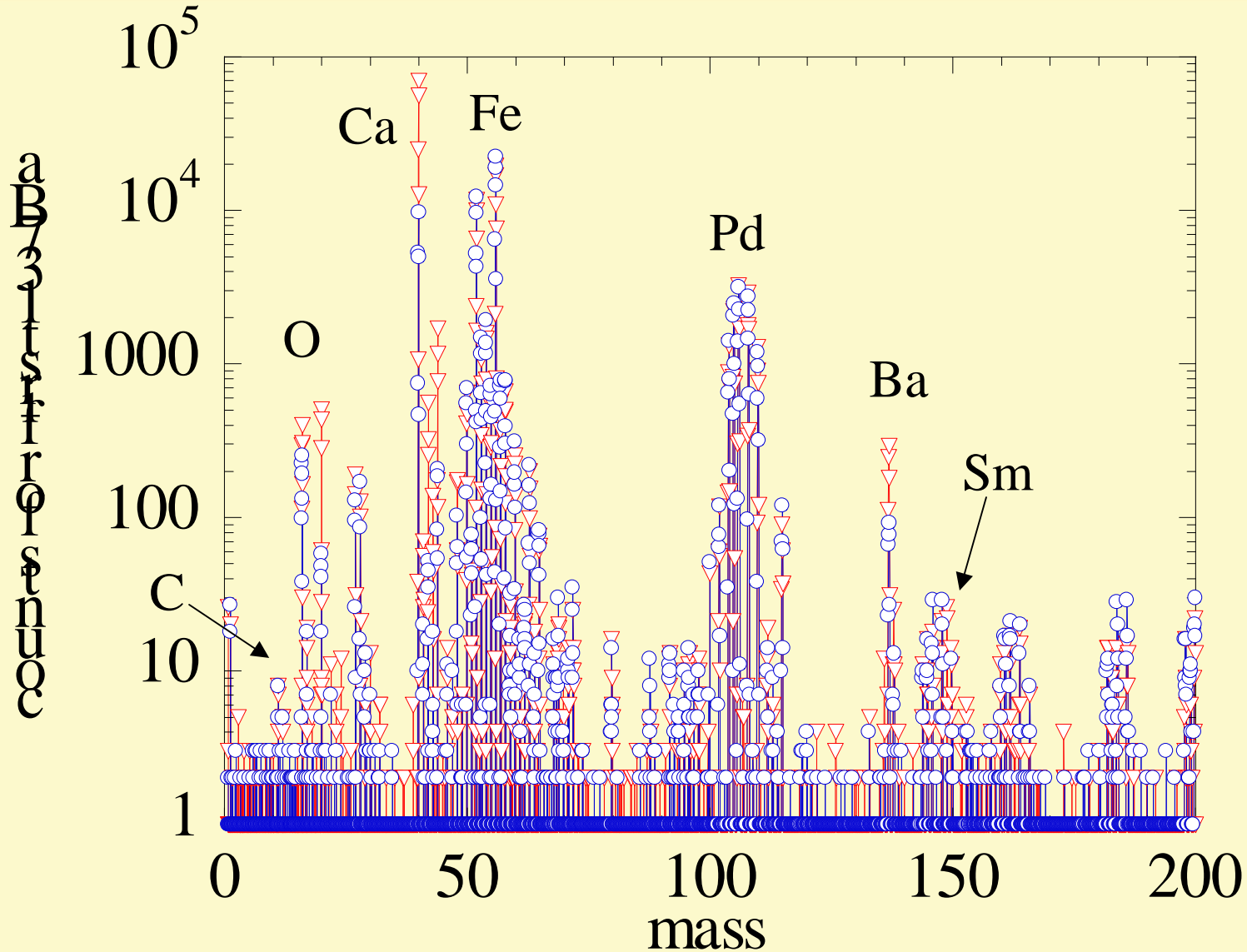
# SIMS Spectra around mass 12 for a Natural Ba Experiment



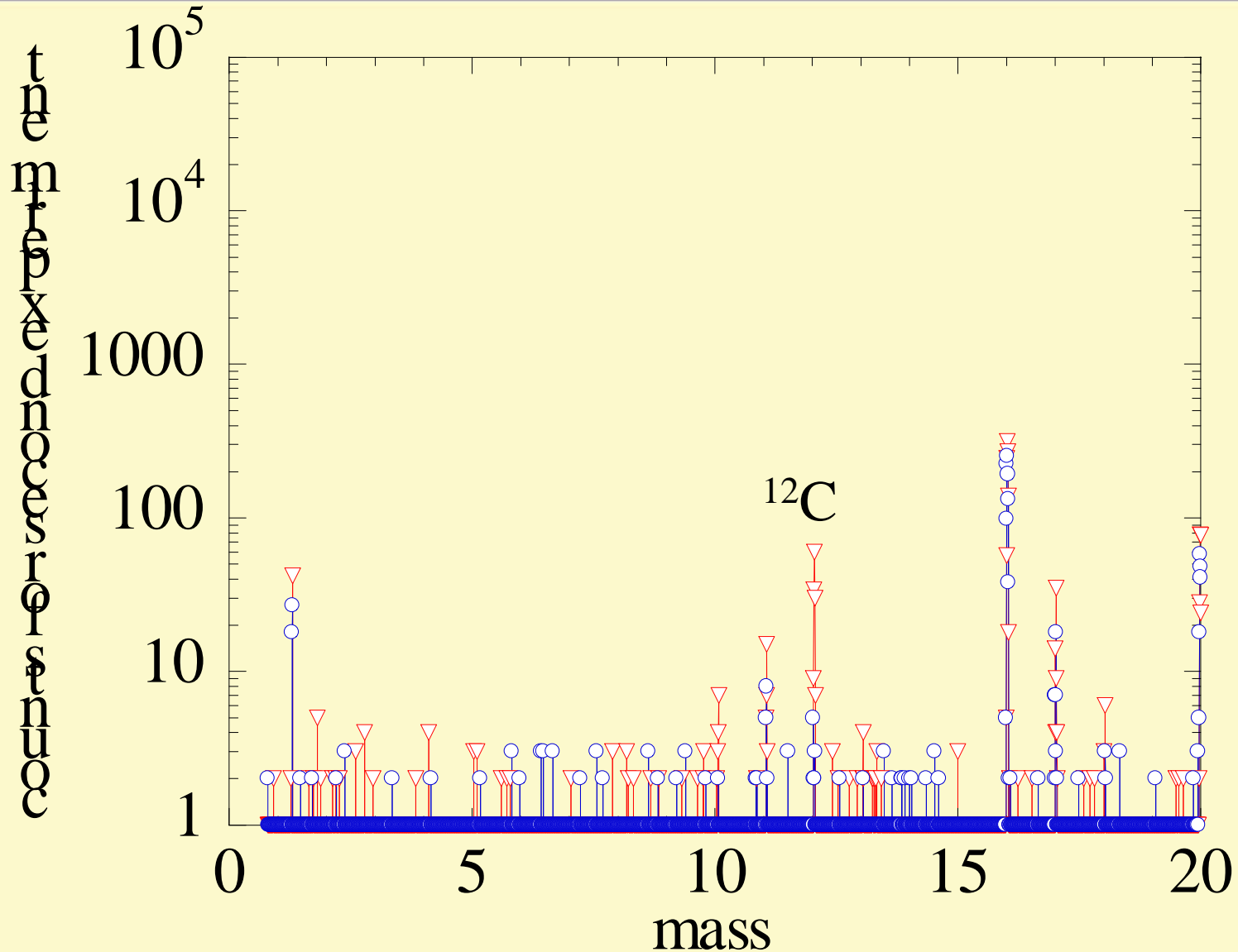
# SIMS Spectra around mass 12 for the first $^{137}\text{Ba}$ experiment



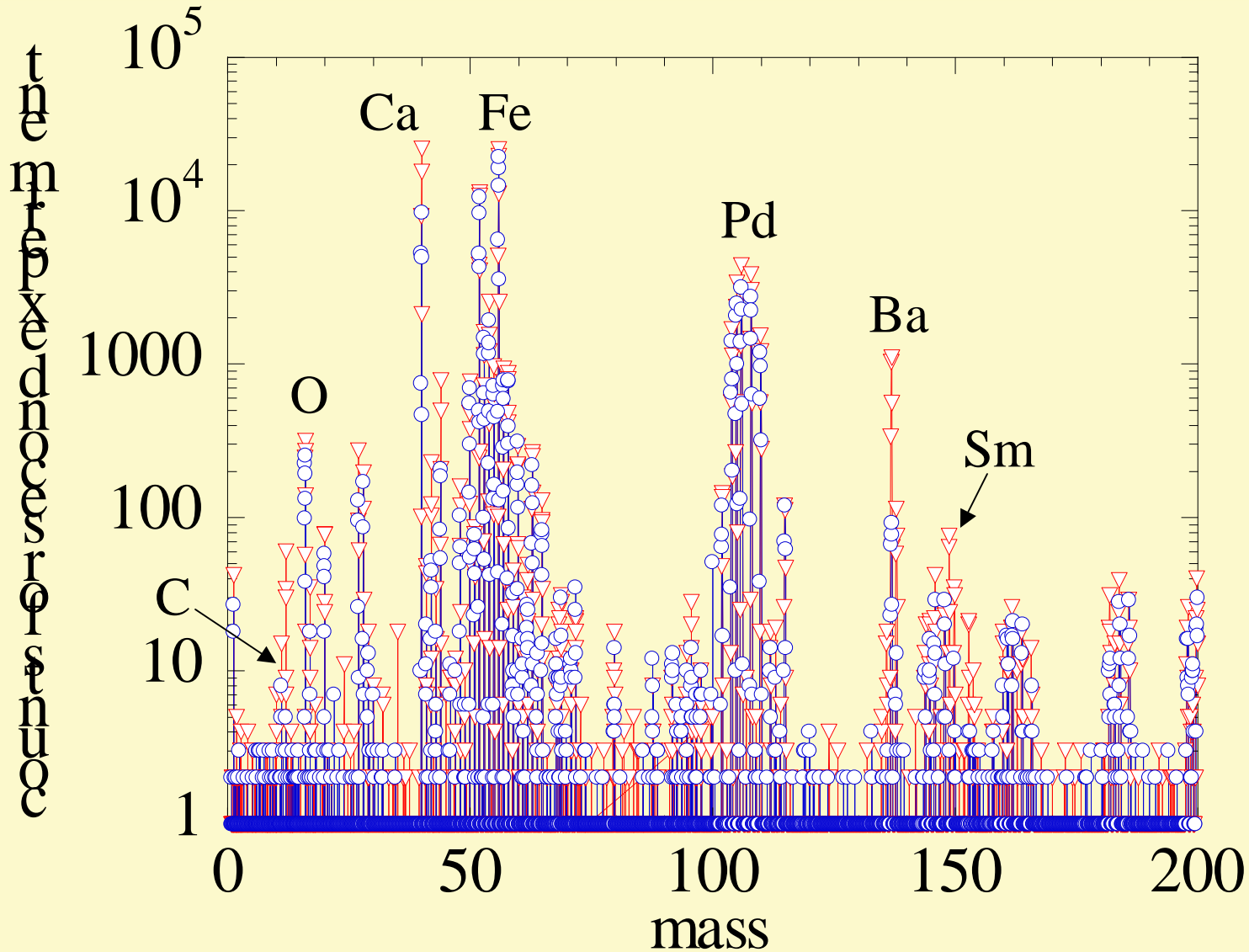
# Full SIMS Spectra for #1Experiment



# SIMS Spectra around mass 12 for the second $^{137}\text{Ba}$ experiment

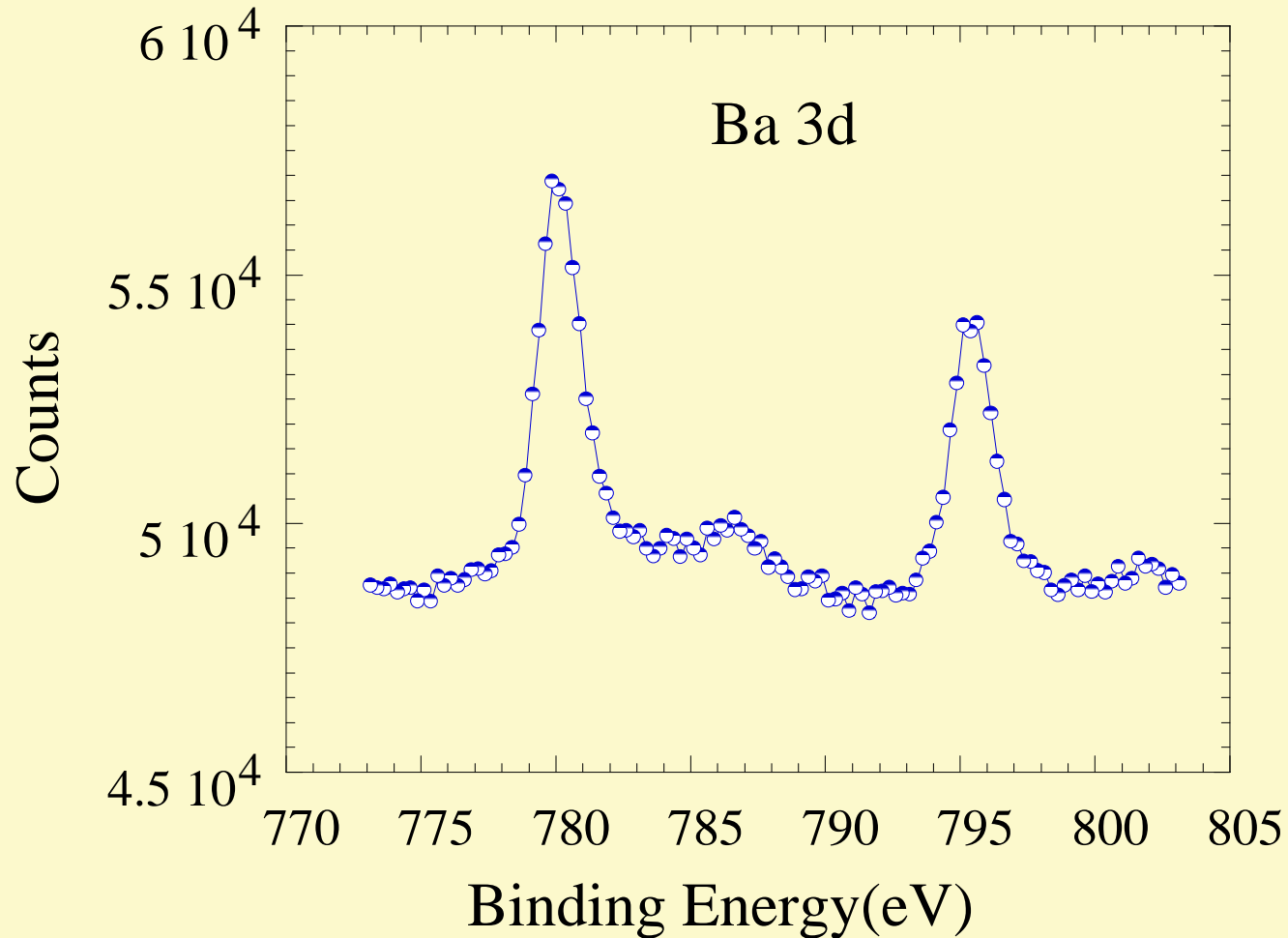


# Full SIMS Spectra for #2Experiment

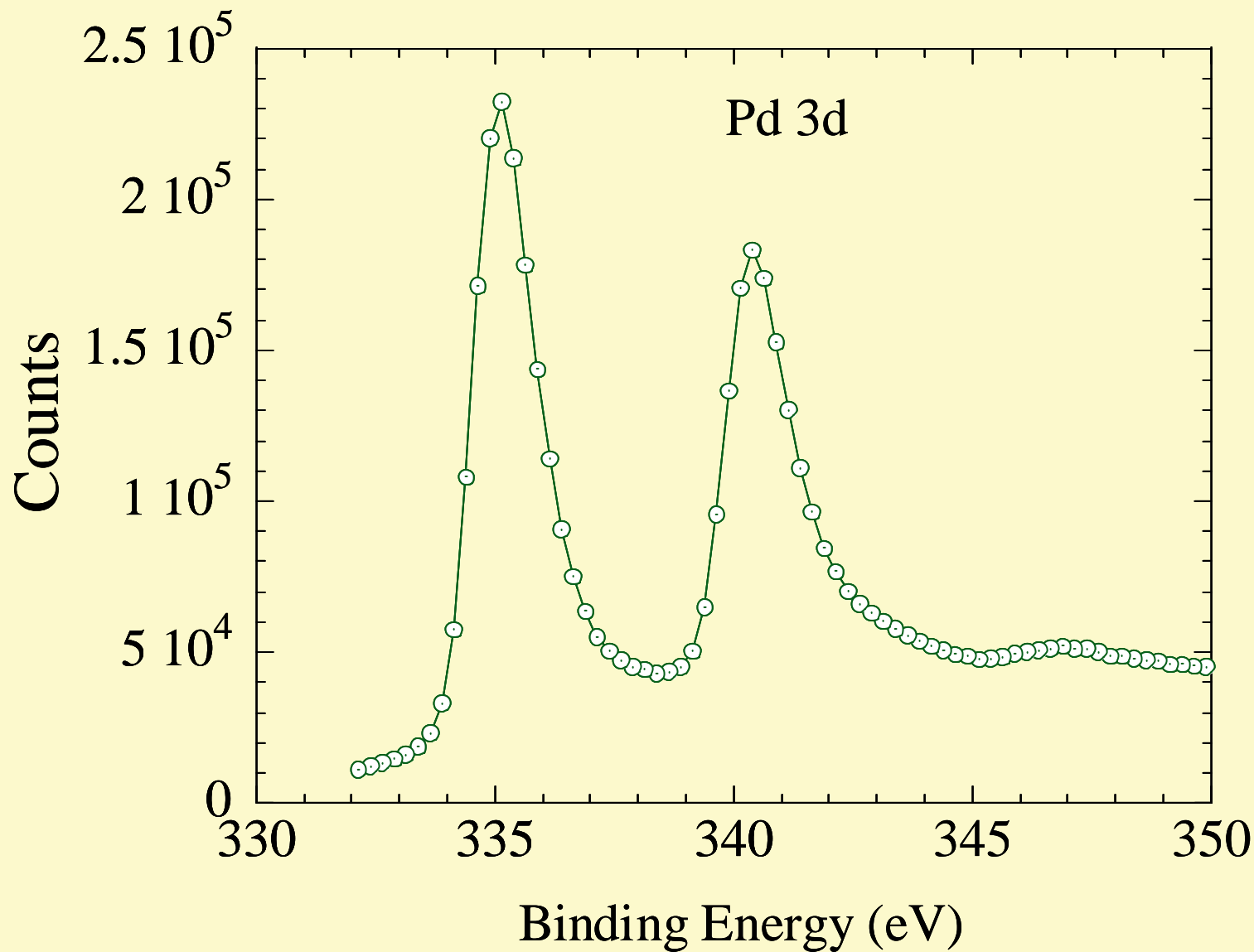




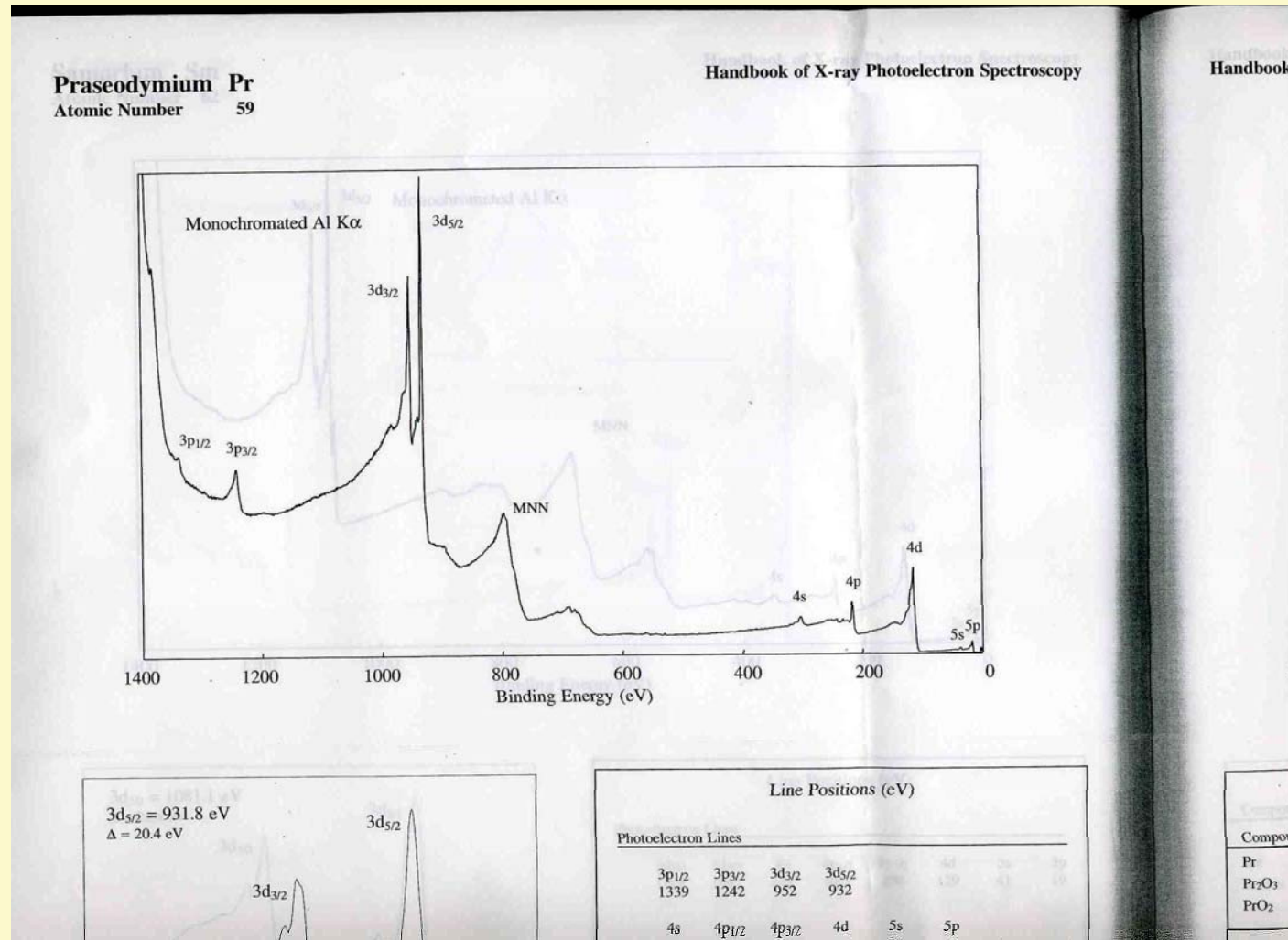
# XPS Spectrum for Ba the second <sup>137</sup>Ba experiment



# XPS Spectrum for Pd the second <sup>137</sup>Ba experiment



# An Example of XPS Spectrum for Pr



# Examination of Molecular Ions

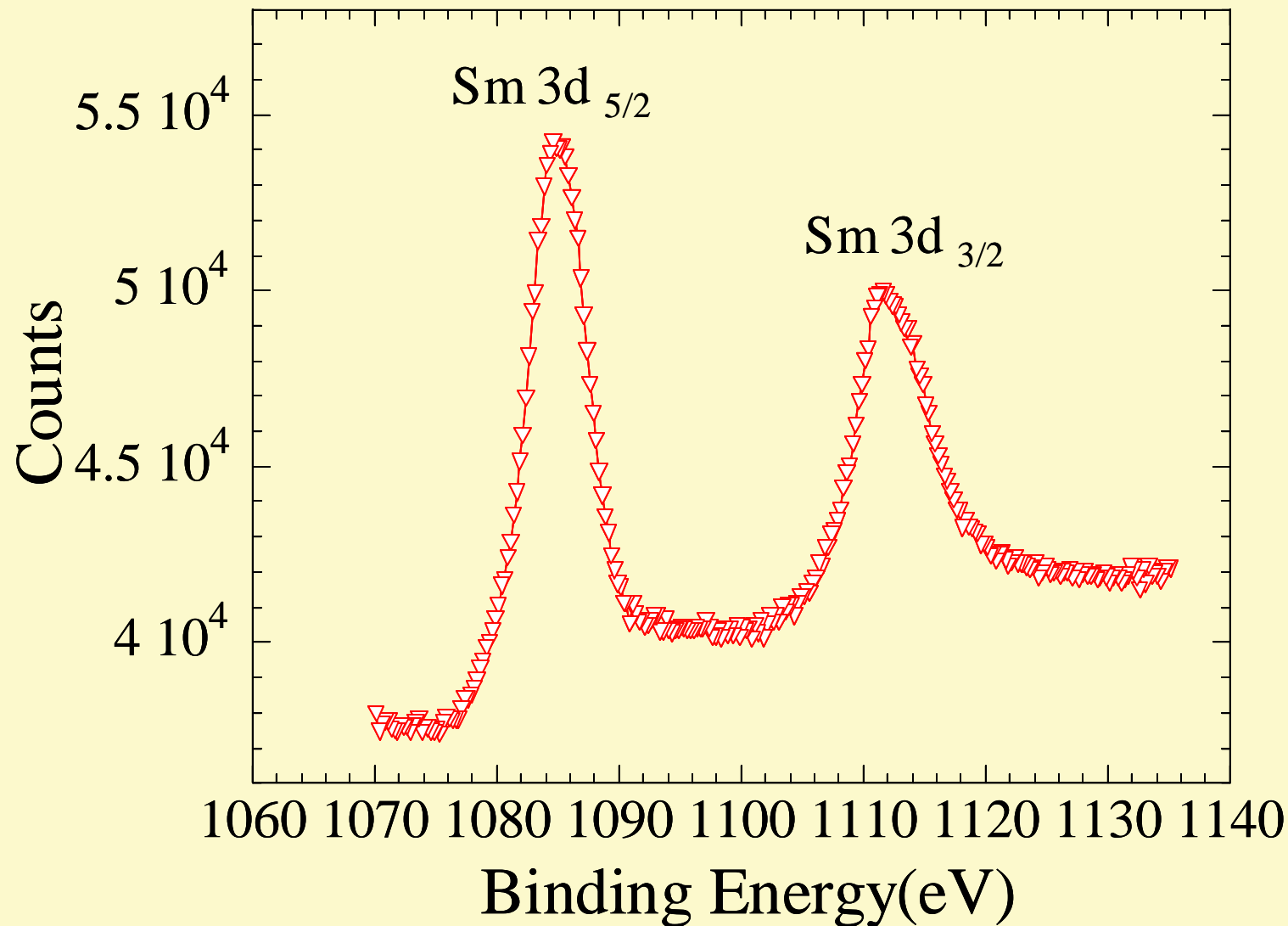
| Pd        | Pd <sup>40</sup> Ca |
|-----------|---------------------|
| 102(1%)   | 142                 |
| 104 (11%) | 144                 |
| 105 (22%) | 145                 |
| 106 (27%) | 146                 |
| 108 (26%) | 148                 |
| 110 (12%) | 150                 |

| Ba         | Ba <sup>16</sup> O |
|------------|--------------------|
| 130(0.1%)  | 146                |
| 132(0.1%)  | 148                |
| 134(2.4%)  | 150                |
| 135(6.6%)  | 151                |
| 136(7.8%)  | 152                |
| 137(11.3%) | 153                |
| 138(71.7%) | 154                |

No Molecular Ions for 149.

<sup>110</sup>Pd(12%)Ca and <sup>134</sup>Ba(2.4%)O for mass 150, however their effects should be lower than <sup>106</sup>Pd(27%)Ca and <sup>138</sup>Ba(71.7%)O

# XPS Spectrum for the detected Sm



# Depth Profile of Cs and Pr by XPS(2)

