**Cavity Ring-Down Data Answer Key**

I0

Intensity (mA)

I0/e



0

Cavity with absorber

Empty cavity

Time (microseconds)

|  |  |  |
| --- | --- | --- |
| **Compound** | ** (cm2/molecule)** | **Letter** |
| SO2 | 6.572659 x 10-19 | D |
| NO | 2.683 x 10-17 | F |
| N2O | 1.47 x 10-19 | B |
| CO2 | 1.137 x 10-16 | A |
| O3 | 3.56 x 10-21 | I |
| H2O | 2.0 x 10-24 | J |
| CH4 | 1.90 x 10-17 | G |
| CO | 2.15 x 10-17 | E |
| SF6 | 4.511 x 10-17 | H |
| NO2 | 6.11 x 10-19 | C |
| CFCs | 5.23 x 10-22 | Example |

 = absorption coefficient in cm-1

 = absorption cross-section in cm2/molecule

N = concentration in molecules/cm3

d = length of the cavity = 1 cm

c = speed of light = 3.0 x 108 m/s = 3 x 104 cm/s

 = time constant for cavity with absorber in s

0 = time constant for empty cavity in s

**MAKE SURE YOUR UNITS MATCH!!!**