

5.61 Fall 2013
Problem Set #1

1. *from McQuarrie, page 37, #7*

2. A pulsed Nd:YAG laser is found in many physical chemistry laboratories.
 - A. For a 2.00mJ pulse of laser light, how many photons are there at 1.06 μm (the Nd:YAG fundamental), 537nm (the 2nd harmonic), and 266nm (the 4th harmonic)?

 - B. The duration of the Nd:YAG laser pulse is 6 nanoseconds. During the laser pulse, (2 mJ at 1.06 μm) what are:
 - (i) the number of photons/second, and
 - (ii) the power in Watts (Joules/second)?

3. *from McQuarrie, page 38, #19*

4. *from McQuarrie, page 38, #21*

5. *from McQuarrie, page 39, #32*

6. *from Karplus and Porter, page 37, #1.14*

7. *from McQuarrie, page 49, #A-1*

8. *from McQuarrie, page 49,50 #A-6 – A-8 and A-10*

9. *from McQuarrie, page 50, #A-9*

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