

AOSC 433/633 & CHEM 433/633 Atmospheric Chemistry and Climate

Admission Ticket, Lecture 20

Due: Tuesday, 23 April 2013 (at start of class)

18 points

Your name: _____

a) (2 points: from Olah) Which source is the largest renewable energy source for the world's production of electricity?

b) (2 points: from Olah) For the answer above, briefly note some "negatives" associated with electricity production using this source of energy.

c) (2 points: from Olah) Of the potential means to generate electricity from renewable sources, which has the advantage of being available all the time (little or no fluctuation in power output)?

d) (2 points: from Olah) What critical "thermodynamic property" governs the profitability of electricity production using geothermal energy?

e) (2 points: from Olah) According to Olah et al. which was published in 2006, what renewable energy source at that time was "the fastest-growing of any energy source?"

f) (2 points: from Olah) How does the output from a wind turbine vary as a function of local wind speed?

g) (2 points: either reading) For “current solar technology” or “currently attainable levels of operating efficiency” of solar energy, what sized area would the U.S. have to devote to electricity generation from solar energy to meet all of its electricity needs?

h) (2 points) How does the *physics* of electricity production from solar thermal power systems (Olah reading) differ from that of solar photovoltaic systems (either reading)?

i) (2 points: Chemistry in Context) The process of “doping” increases the efficiency of solar PV. Specifically, what types of photons can be utilized in a properly “doped” semiconductor that would otherwise not be tapped?