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#!/usr/bin/python
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__question__="hw1_q6"


from math import log
from numpy import arange


def langmuir( x, Ka ):
    """
    Use the Langmuir adsorption isotherm to calculate X
    :param x: float( adsorption of gas? )
    :param Ka: float( ligand binding constant Kassociation )
    :return float
    """
    X = ( float( Ka ) * float( x ) ) / ( 1 + ( float( Ka ) *
float( x ) ) )

    return X


x_concentrations = [ float( 10**-x ) for x in arange( 0, 14, 0.1 ) ]
langmuir_values = []
for Ka in [ 10**3, 10**6, 10**9, 10**12 ]:
    langmuir_values.extend( [ langmuir( x, Ka ) for x in
x_concentrations ] )
```