Length scales and scattering angles

energy (keV) and wave vector (invA)   flight path length (mm)

$E := 10$ $k := \dfrac{2 \cdot \pi}{12.4} \cdot E$ $L := 1000$

typical lengths (A) :

$d_0 := 1$ $d_1 := 2$ $d_2 := 5$

$d_3 := 10$ $d_4 := 20$ $d_5 := 50$

$d_6 := 100$ $d_7 := 200$ $d_8 := 500$

$d_9 := 1000$ $d_{10} := 2000$ $d_{11} := 5000$

$d_{12} := 10000$

$i := 0 .. 12$

scattering vectors (invA)   scattering angles (deg)   displacement on CCD (mm)

$q_i := \dfrac{2 \cdot \pi}{d_i}$ $tth_i := 2 \cdot asin\left(\dfrac{q_i}{2 \cdot k}\right)$ $x_i := L \cdot tan\left(tth_i\right)$

table

i	d_i	q_i	$\dfrac{tth_i}{deg}$	---------	x_i
0	1	6.283185	76.632	| XRD	4208.072
1	2	3.141593	36.118	|	729.706
2	5	1.256637	14.246	|	253.894
3	10	0.628319	7.109	---------	124.72
4	20	0.314159	3.553	|	62.09
5	50	0.125664	1.421	| WAXS	24.806
6	100	0.062832	0.71	|	12.401
7	200	0.031416	0.355	---------	6.2
8	500	0.012566	0.142	| SAXS	2.48
9	1000	0.006283	0.071	|	1.24
10	2000	0.003142	0.036	---------	0.62
11	5000	0.001257	0.014	| USAXS	0.248
12	10000	0.000628	0.007	|	0.124