Prelab Lab 2

February 3, 2026 3:33 PM

If the microscope's calibration factor is 100 nm / pixel, what dilution of beads do you need to make to achieve the desired density in the viewing area? The density of polystyrene is ≈ 1.05 g/ml. Assume that the depth of field ≈ 5 μm and that you are doing your first measurements with beads with diameter 1 μm. Assume, also, that the concentration is as specified in Sec. 2.2.

Pixel pitch:
3.45um per pixel
WRONG - 100nm per pixel

Conc. 0.5% weight by volume

20 beads per 1440x1080 pixels x 0.1um per pixel
= 20 beads per 144 x 108 um x 5um

G of beads
0.5um rad per bead = 0.5236 um^3
/1000^3= 0.5236*10^-9 mm^3
/1000 = 0.5236*10^-12 cm^3 (ml)
X1.05g/ml = 5.4978*10^-13 g/bead

Volume of image = 77,760um^3/1000^3 = 77.76*10^-6 mm^3
/1000 =7.776*10^-8 ml
Beads per ml = 20/7.776*10^-8 ml = 2.572*10^8 beads/ml

g/bead * bead/ml = g/ml = 0.0001414

0.005g/1ml initial

Initial/final conc. = 35.36X dilution
