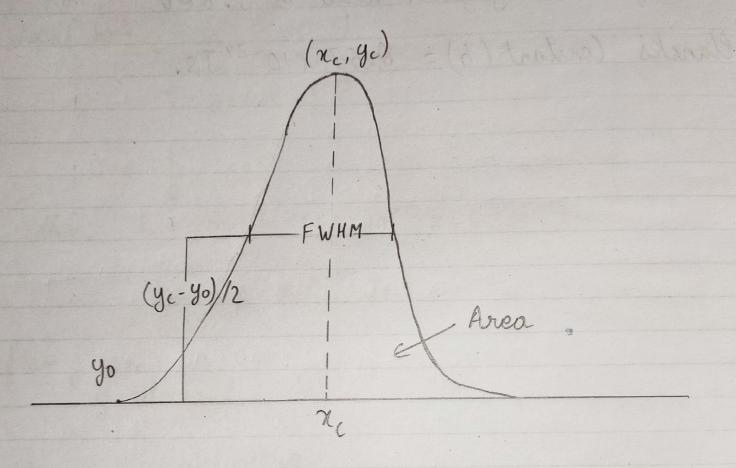
20BDS0406 Name of the Experiment

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	Date:	
	Engineering Application of Nanomaterials	
	and the state of t	
	Milating Charles in the Ind. 180	
1	Tools Pouris and	
H	Tools Required	
L	i) XRD pattern	
L	ii) teak fitting trogram (Open source/	
	ji) Peak Sitting Program (Open source / Gree software like Gityk', gruplot',	
	'atiplot')	
H	( )	
H		
L		
	<u> aprilipado</u>	algern?
	SLO	
-	To dotagains the suprane sautallite size from	
-	10 cerement and overland of	
H	To determine the average crystallite size from given X-ray diffraction (XRD) pattern of	
L	polycrystalline moterial.	
	O V CONTROLL NO.	
	Control of the contro	
r	Eormula to Use:	
H	Lo Cmula do asse	
	The Scherrer equation is used to calculate the crystallite size. This method gives qualitative result.	
	The Scherrer equation is used to calculate the	
	crustallite size. This method gives qualitative	The state of
	1 and the	
-		
-		
	The Scherrer's equation is:	
	D = K A	
1	$D = \frac{K \lambda}{\beta \sin \theta}$	
1	15 SW U.	
1	and the second	



Eig 1. Peak Jitling using Goussian/Brendovoigt Eunction

Name of the Experiment	Page No. Date:						
Hore, I feak Width (B in rudians)							
o) Crystullite size (D) o) Scherrer's constant (K) o) X-Ray Wavelength (A) o) Peak position (D)							
·) X-Ray Warreleasth (A)							
·) Peak position (0)							
Data Given							
i) Instrumental broadening: 0.01° ii) Wavelength (1) of X-Ray used: 1.5406 Å  iii) Scherrer's constant (K) = 0.94							
(assuming orystallite are spherical in shape)							
Shape)							
Interesce							
Inference The average crystallite size is	23.741	m.					

## Tabulation

		THE PERSON OF THE PROPERTY OF THE PARTY OF T			
Ī	Peuk Centre	0	FWHM(B)	FWHM(B)	Average
	Peuk Centre (20) (dey)	(deg)	(deg)	(rad)	Crystallite
		( ))	37		Size (1m) 25.94
T	28.57	14.285	0.33	5.76 x 10-3	25.94
	47.54	23.77		6.79 × 10-3	23.3
	56.37	28.185	0.419	7.31 × 10-3	22.48
	33.13	16. 565	0.349	6.09 X 10-3	24.81
	59.13	29,565	0.43	7.5×10 <sup>-3</sup>	22.19

Sample Calculation

here K=0.94,  $\lambda = 1.5406 \times 10^{-10} \text{ m}$ .

0 = 14.285 and B = 5.76 × 10-3

So, 
$$D_1 = \frac{KA}{8\cos\theta} = \frac{0.94 \times 1.5406 \times 10^{-10}}{5.76 \times 10^{-3} \times \cos(14.285)}$$

:. D, = 25.94 nm

Similarly,  $D_2 = 23.3 \text{ nm}$ ,  $D_3 = 22.48 \text{ nm}$ ;  $D_4 = 24.81 \text{ nm}$  $D_5 = 22.19 \text{ nm}$ 

Then, Dang = (D, + D2 + D3 + D4 + D5)/5

= 25.94t23.3 + 22.48 + 24.81 + 22.19 5

.. Dang = 23.74 nm