Colloidal gold nanosphere dispersions in smectic liquid crystals and thin nanoparticle-decorated smectic films

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(p n p on n)
on n p on n p o g o n no p o p o
p on n k g n p n
w n w p n no n on n n (< n) p o o
o op ow o on n nop o
on n on ong ng o k n n on
p gg g on n n n n ng n no p on n
o op

[o]

I. INTRODUCTION

p on o o p n n o op
n n n ng o o n n
p n no og pp on n po n S
o o op n n n
(C) ong n o op ong ng n
on n o o n p n
n on p n on opo og n *director*
o ng o n p n
o n on o n ng C n
o on n on n on on C n

(Φ) ρ p n on ρ o n
o o w w C n A p
n w on n o o ρo o
op ρ o p on o ρ o o w
po n n o ρ ρρ
ρ w n po ρn n o ng
n ng o o w ow o po o w o
ρn A p w *director* ong
ρρ ng on w o ρ n ρ o p on p n
A p (at C) were obta ned us n t e
Ocean Opt cs n ature ber opt c spectro eter (B)
nte rated w t a po ar z n croscope O y pus BX
(To yo Japan) For t e AFM stud es t e xture of t e
coated GN s n et y a co o and LC w c was o o
en zed by cont nuous st rr n for was sp n coated at
revo ut ons per nute on a s con ( ) substrate T e sa p e
surface orp o o y was stud ed us n nanoscope III AFM
(fro D ta Instru ents) n t e tapp n ode To easure
t e avera e t c ness of t e s ect c surface supported

t e surface pro e s ow t e defect nduced d p es n t e case of pure CB [F (f)] and t e ra sed bu ps due to part c e nduced ayer defor at ons n t e case of t e LC GN d spers ons [F ( )] nce t e s ect c A ater a s a D so d t at possesses a quas on ran e trans at ona or der n t e d rect on perpend cu ar to ayers t e surface or p o o y v sua zed by AFM re ects t e pro e of t e top s ect c ayer n t e t n T e apparent var at on n t e e t of nd v dua bu ps t be due to po yd spers ty of part c e s zes (trans ss on e ectron croscopy data s ow t at part c e d a eters vary fro to n w t an aver a e s ze of ~ n) for at on of d s ocat on oops of d f

sp ere d spers ons n sotrop c u ds t s of reat funda en ta nterest to exp ore t e feas b ty of ac ev n ordered per od c se f asse b y of nanopart c es and spat a struc tures co posed of nanopart c es and part c e e structures n a e ar LCs

IV. CONCLUSIONS

In conc us on we ave de onstrated t e en anced co o da stab ty of s ect c A LC nanopart c e d spers ons as co pared to t ose n ne at cs s n exper enta and co puter s u ated spectra we ave s own t at t e nterpart c e separat ons between so ated eta nanopart c es n t e bu of s ect c a e ae re a n ar e even for y concentrated suspens ons Nanopart c es n t n s a so do not a o erate but rat er od fy t e free surface pro e of t e due to ayer d stort ons around t e nc us ons n t e LC bu T e nanosca e d spers ons are of nterest for tec no o es t at requ re co pos tes cons st n of nanopart c es and a d e ectr c atr x w t tunab e propert es and nterpar t c e d stances w c ay prov de eans of spat a structur