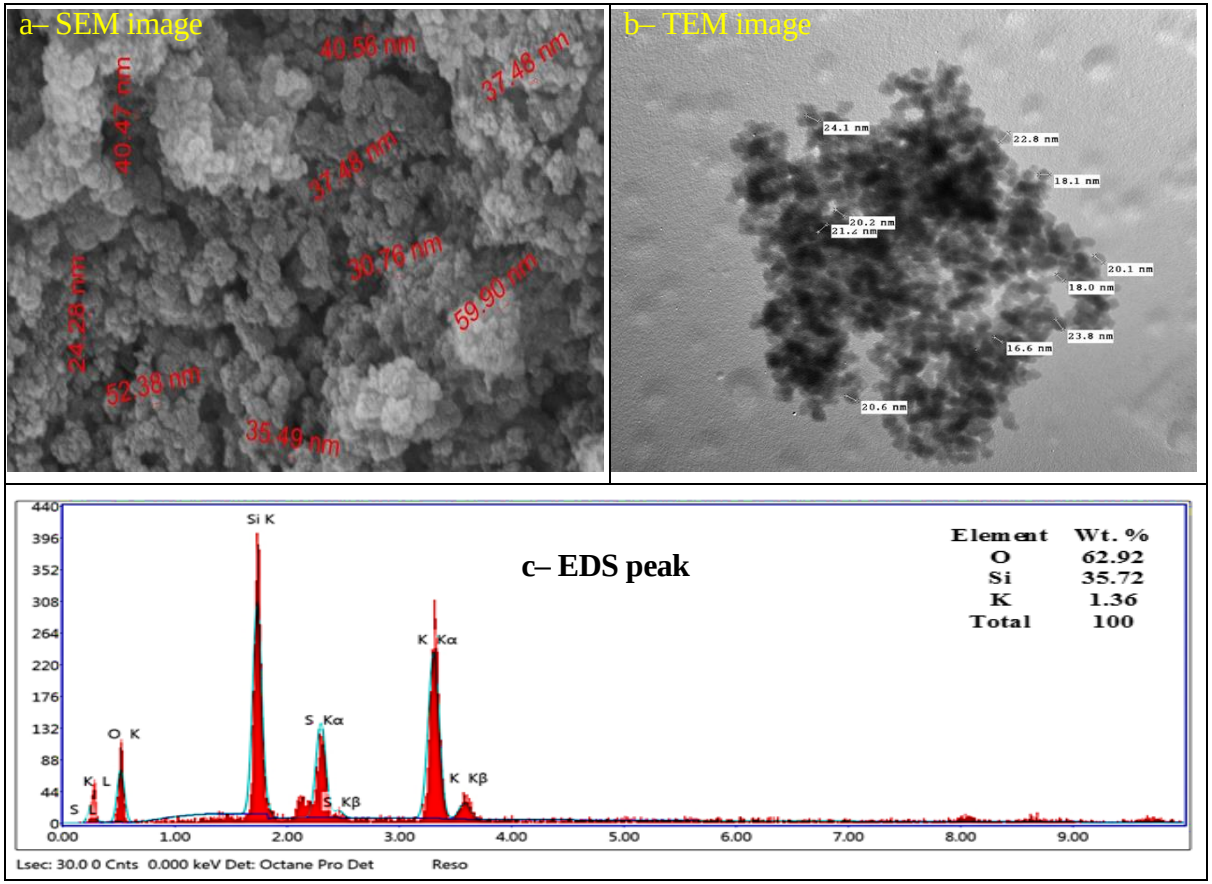
a– SEM image
40.56 nm
37.48 nm
40.47 nm
37.46 nm
30.76 nm
59.90 nm
24.28 nm
52.38 nm
35.49 nm
b– TEM image
24.1 nm
22.8 nm
18.1 nm
20.2 nm
21.4 nm
20.1 nm
18.0 nm
23.8 nm
16.6 nm
20.6 nm
c– EDS peak
Element Wt. %
O 62.92
Si 35.72
K 1.36
Total 100
Si K
K Kα
S Kα
O K
K L
S L
K Kβ
S Kβ
440
396
352
308
264
220
176
132
88
44
0
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00
8.00
9.00
Lsec: 30.0 0 Cnts 0.000 keV Det: Octane Pro Det Reso

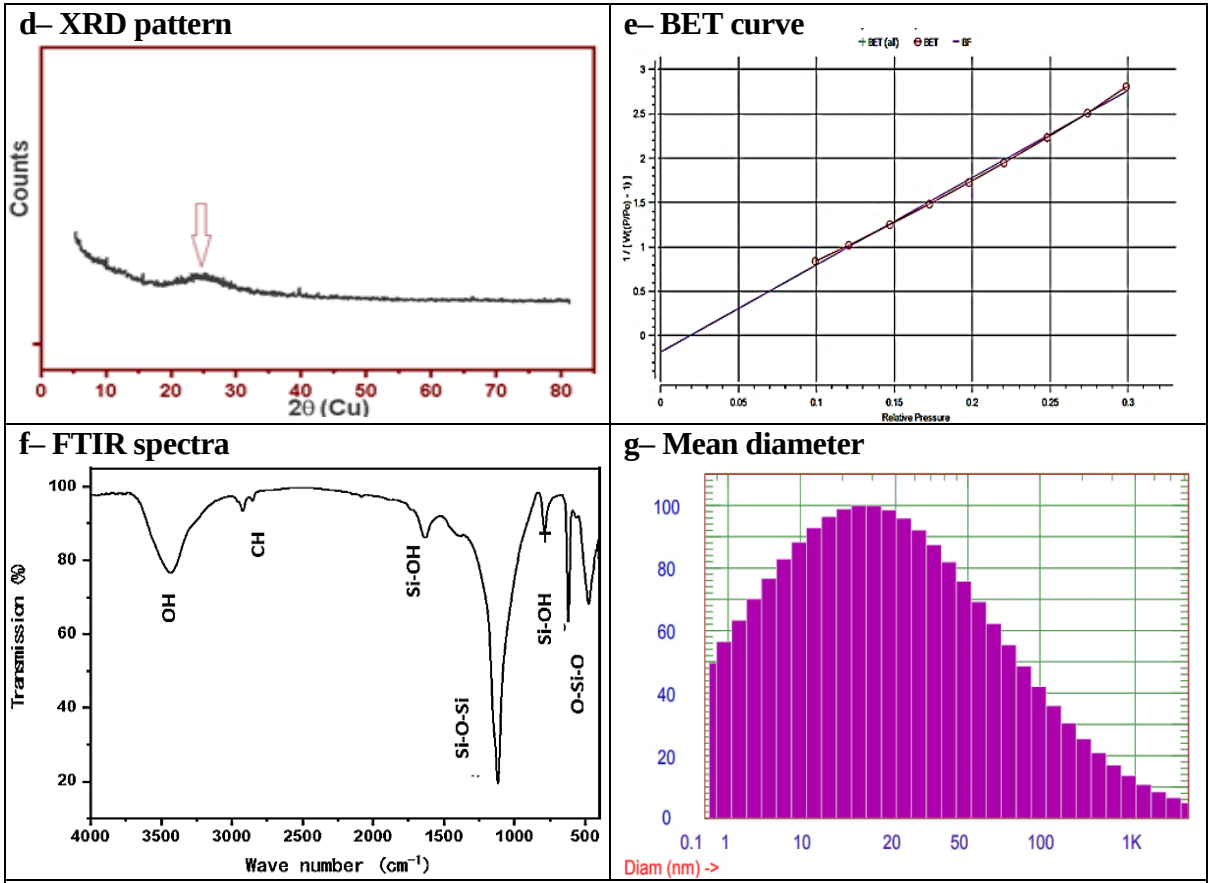

Figure (1): Characteriziation of used nano-SiO2 SEM (a), TEM (b), EDS (c), XRD (d), BET (e), FTIR (f) and mean diameter (g).

Table (3): Influence of nano–SiO_2 on some yield parameters of wheat crop grown in saline soil.

Water source	Si– addition methods	Biomass (g)	Grains (g)	1000–grains weight (g)
Tap water	Check	26.65	7.66	17.41
	Soil	32.34	9.62	22.13
	Foliar	38.40	9.31	22.43
Saline water	Check	24.59	5.86	14.44
	Soil	34.60	9.70	21.48
	Foliar	39.53	13.33	23.09
Statistical analysis				
Factor		Biomass	Grains	1000–grains weight
Main factor:	TW	32.46	8.86	20.65^{a}
Water quality	SW	32.91	9.62	19.67^{b}
Sub–factor:	LSD 0.05	NS	NS	0.55
Si–addition methods	Check	25.62^{c}	6.76^{b}	15.93^{c}
	Soil	33.47^{b}	9.66^{a}	21.81^{b}
	Foliar	38.97^{a}	11.32^{a}	22.76^{a}
	LSD 0.05	4.02	1.69	0.89
Interaction	W*Si	*	*	*

Table (4): Influence of nano–SiO_2 on N, P, K, Si and Na contents (%) of wheat crop grown in saline soil.

Water source	Si– addition methods	Straw					Grains				
		N	P	K	Si	Na	N	P	K	Si	Na
Tap water	Check	0.33	0.03	0.76	1.16	0.09	2.57	0.52	1.13	0.21	0.03
	Soil	0.38	0.04	1.09	3.84	0.05	2.69	0.52	1.77	0.02	0.03
	Foliar	0.35	0.07	1.02	4.15	0.04	2.66	0.62	1.37	0.2	0.05
Saline water	Check	0.22	0.04	0.65	1.76	0.25	2.18	0.39	1.27	0.21	0.11
	Soil	0.20	0.08	1.06	4.21	0.1	2.60	0.46	1.73	0.09	0.06
	Foliar	0.27	0.1	0.99	4.84	0.08	2.46	0.42	1.4	0.2	0.06
Statistical analysis											
Factor		N	P	K	Si	Na	N	P	K	Si	Na
Main factor: Water quality	TW	0.35^{a}	0.05^{b}	0.96	3.05^{b}	0.06^{b}	2.64^{a}	0.56^{a}	1.42	0.14	0.03^{b}
	SW	0.23^{b}	0.07^{a}	0.89	3.60^{a}	0.14^{a}	2.41^{b}	0.42^{b}	1.46	0.16	0.07^{a}
Sub–factor:	LSD 0.05	0.06	0.01	NS	0.09	0.02	0.14	0.01	NS	NS	0.02
Si–addition methods	Check	0.28	0.03^{c}	0.70^{b}	1.46^{c}	0.17^{a}	2.37^{b}	0.46^{c}	1.20^{c}	0.21^{a}	0.07^{a}
	Soil	0.29	0.06^{b}	1.01^{a}	4.03^{b}	0.07^{b}	2.56^{a}	0.49^{b}	1.38^{b}	0.05^{b}	0.05^{b}
	Foliar	0.31	0.09^{a}	1.07^{a}	4.49^{a}	0.06^{b}	2.64^{a}	0.52^{a}	1.75^{a}	0.19^{a}	0.04^{b}
	LSD 0.05	NS	0.01	0.06	0.05	0.01	0.11	0.02	0.08	0.07	0.01
Interaction	W*Si	*	NS	NS	NS	*	NS	*	NS	NS	NS

Table (2): Some water quality parameters of the two used water.

Water type	EC dS m^{-1}	pH	Soluble ions meq. L^{-1}								SAR $(meq.L^{-1})^{0.5}$	RSC meq. L^{-1}
			Cations				Anions					
			Na^{+}	K^{+}	Ca^{2+}	Mg^{2+}	Cl^{-}	CO_3^{2-}	HCO_3^{-}	SO_4^{2-}		
Tap water	0.41	7.65	1.67	0.56	1.06	0.81	1.53	=	1.21	1.36	1.38	– 0.66
Saline–water	8.00	7.42	44.05	3.43	20.36	12.16	60.04	=	12.81	7.15	8.57	– 19.71