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Preparation Competent Aromatic Silica Gel

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Abstract:

The Aromatic Silica Gel derivatives were prepared from the preparation of the Dasanium salt in a cooled acid medium, and mixed with the silica gel salt to obtain organic silica ; and from the Infrared Spectrum (FT - IR) clear values of the aromatic ring at the stress stretch (νC = C) at the range (1515 – 1645) cm^{-1}. Also, the images of the Scanning Electron Microscope (SEM) showed clear distances in the material in a partially deformed and crystalline form after the embellishment process.

Introduction:

Silica Gel : silica gel is an inert and non-toxic chemical, an amorphous form of silicon dioxide, has a network of porous structure of interlocking or interconnected microscopic cavities giving a typical surface area of 700-800 m^2/g ; or in other words , the interior surface area of a teaspoon of silica gel equivalent to a football field, this structure is what makes silica gel a high-capacity dried substance.

Water molecules adhere to the surface of silica gel, because its steam pressure is lower than that of the ocean air, when a balance of pressure is reached does not cause further adsorption, in addition to its high absorption capacity, as it shows a long age resistant to impurities, and can be recycled economically.(2)

Porous substances can be widely classified from IUPAC based on pore diameter into three small categories that are smaller than 2 nm , the middle group of 2-5 nm and larger than 50 nm .(3)

One of the most common methods for the preparation of silica gel is from koxides, especially from Tetra Methyl Orthos Silica (TMOS) or Tetra Ethyl Ortho Silicate (TEOS) ; but other cocosides with longer calcides can be used . Modified silicones can be prepared from sodium silicate that are less expensive and can also be combined with koxides, and (TEOS) can only be a source of silica. Koxides decompose and polymerize to form a network of silica that can control the steps by changing the degree of acidity and adding salts to water solutions.(4)

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Practical Part:

Preparation of Silica Derivatives - Aromatase Gel

Silica Gel Aromatization Derivatives were prepared through the following steps:

Step 1: Preparing silica salt **:-**

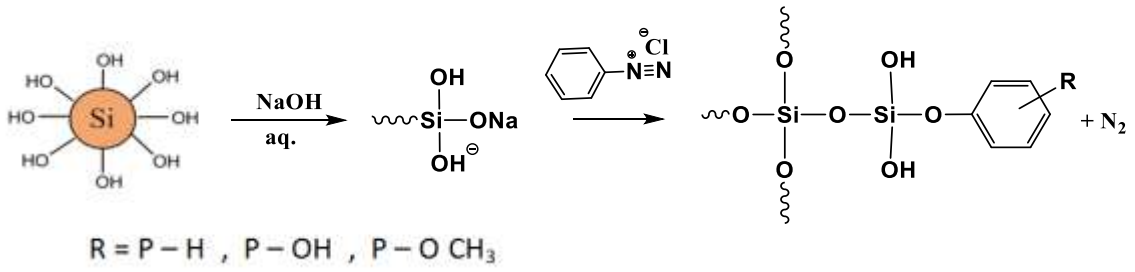
Place 1 g of high porous gel silica in a suitable flask containing a solution of 10% sodium hydroxide and heat the mixture to 60 ^{o}C for (5-10) minutes and then filter and dry.

Step 2: Preparing dayazoneum salt :-

Daesonium salt was prepared with the addition of 0.001 moles of enillin or one of its reflux in a flask containing a 1:1 solution (water: concentrated hydrochloric acid) chilled using a snow bath at a temperature of (0-5) ^{o}C ; and melted in another flask 0.001 mol 0.6 g of sodium nitrite in the least amount sufficient to dissolve from distilled water, add the second flask to the first flask gradually within 5 minutes with cooling and continuous stirring.

Step 3: Blending ingredients

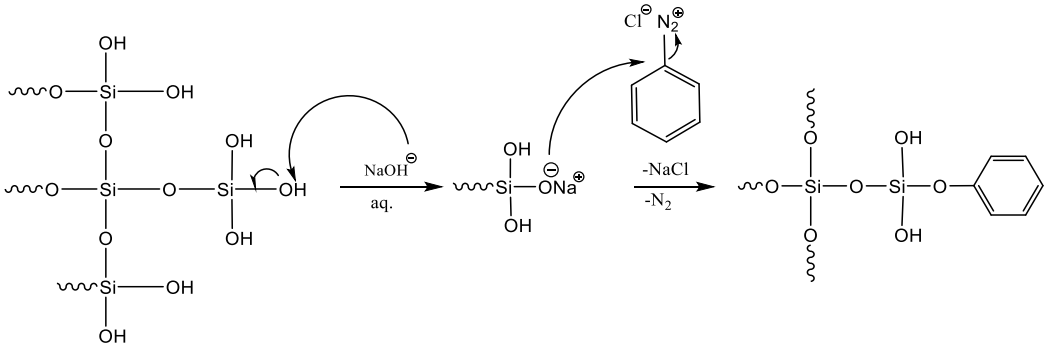
By adding the components of the second step to the first step, stirring for (10-15) minutes at room temperature and until the color of the mixture is stable ; then filter and wash with distilled water and dry at 60 ^{o}C [(5)].



Discussion:

Diagnosis of Silica Gel Aromatized Derivatives

Prepare dazanium salt in an acid medium and mix with silica-gel salt for organic silica according to the mechanical mechanism (6):



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The Infrared Spectrum (FT-IR) of vehicles (3-1) from figure (1) to shape (3) showed clear values of the aromat ring when the (νC = C) in range (1515-1645) cm-1 , and (ν)Si-O) within range (3400-3446) cm-1, and a stretch package (νC-O) at range (1051-1095), and other (FT-IR) data was given to the functional totals that characterize these compounds in the following table:-

Table (1) shows the values of infrared spectra of vehicles(1-3)

Comp. No.	νSi-OH	Ar νC – H	νC = C	V(Si-O)-C	Other
1	3400	3030	1568 -1645	1051	νC–(OH),3419
2	3438	3116	1645 - 1515	1064	……..
3	3446	3097	1645 - 1568	1095	νC-O-C,1294

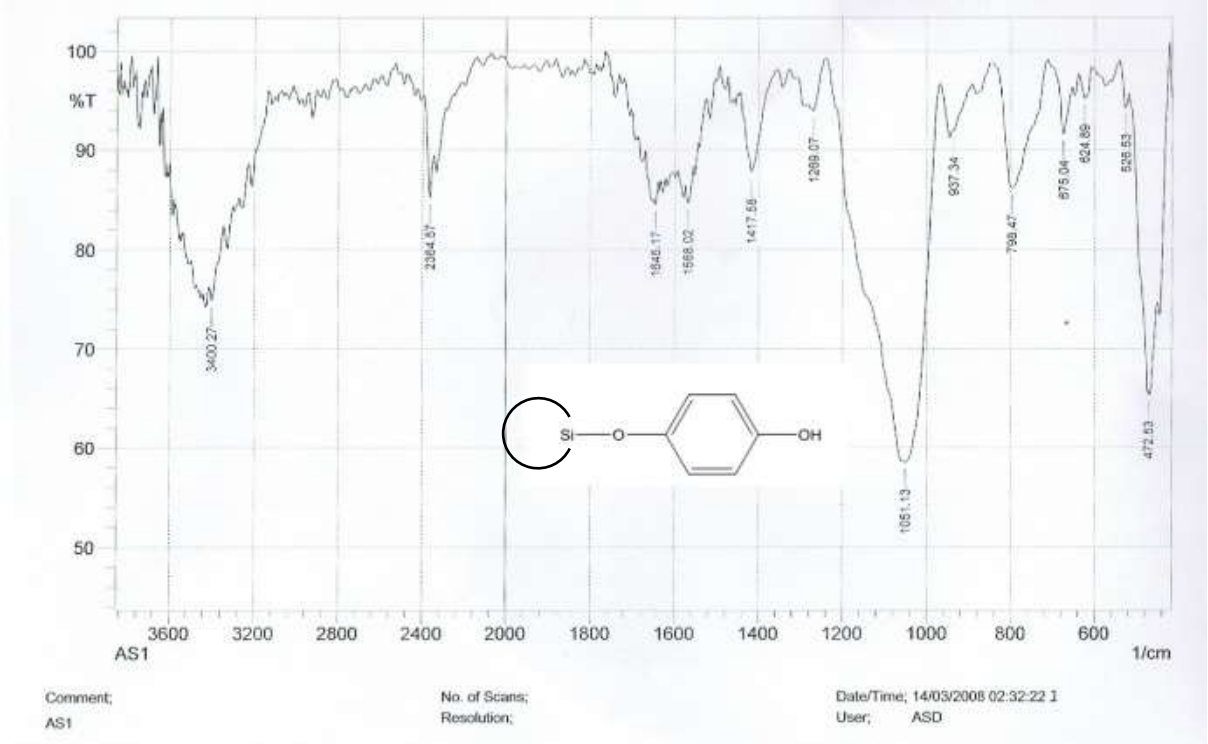

Figure (1) Infrared Spectrum (FT-IR) of the compound(1)

SEM scanner images showed compound 1 nanomeals resulting from the preparation reaction, reaching the top of 20.03 nm (a), and showed clear distances in matter (b) and partially distorted after the decoration process (b) with the appearance of distance shapes on particles as if (cauliflower fruit) (c), (d) which is identical to the shapes in literature [(1)], with the observation of distance.

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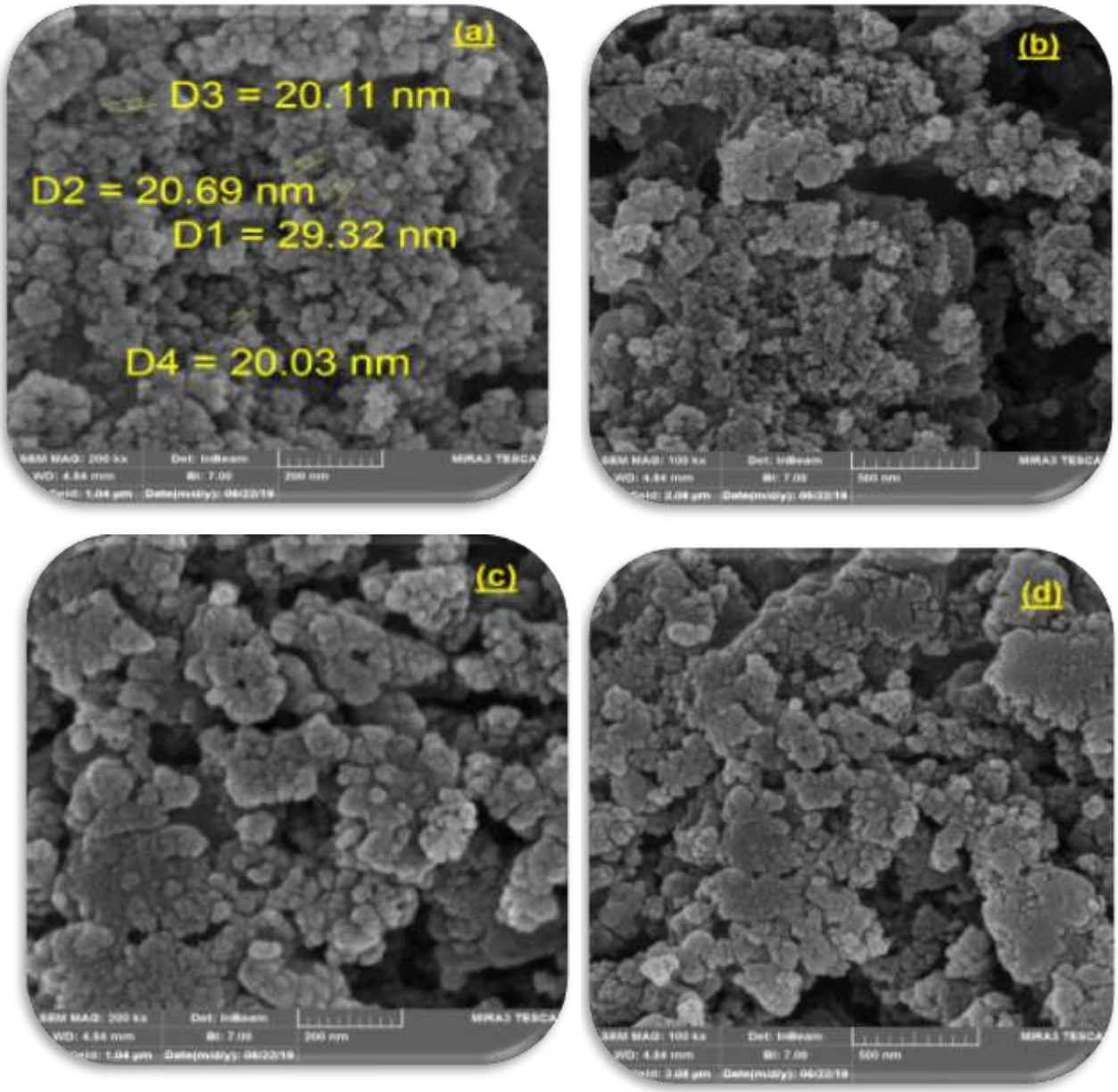

Figure (2) Pictures (SEM) of Comp.1 (a, B, C, D)

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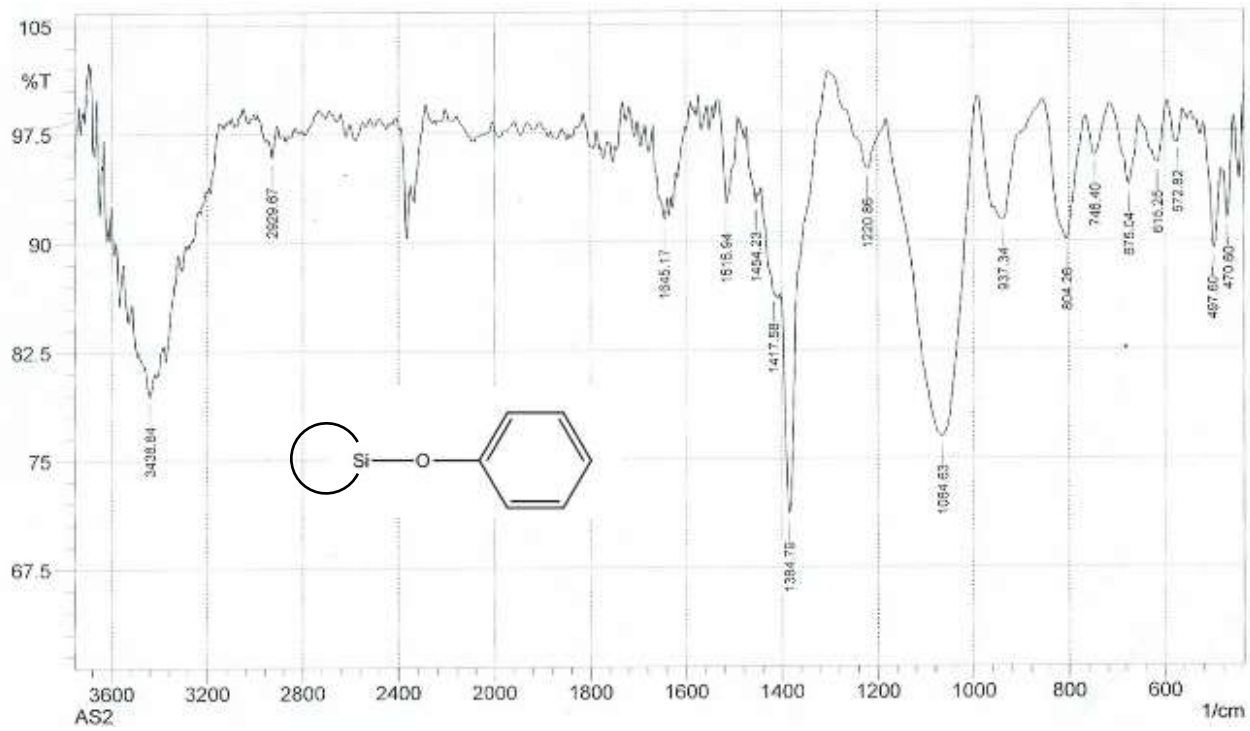
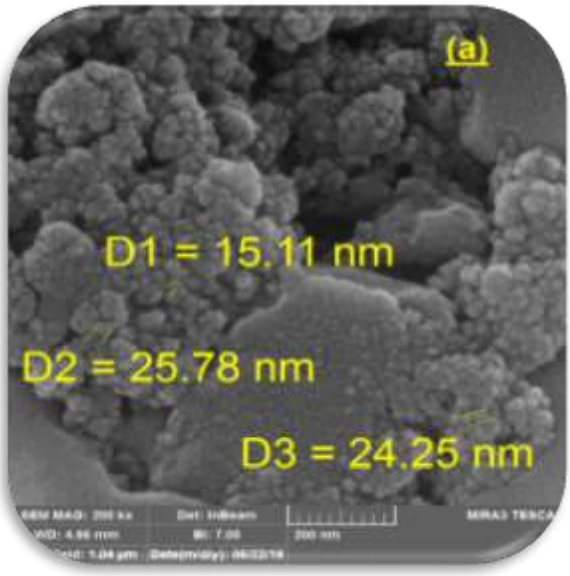
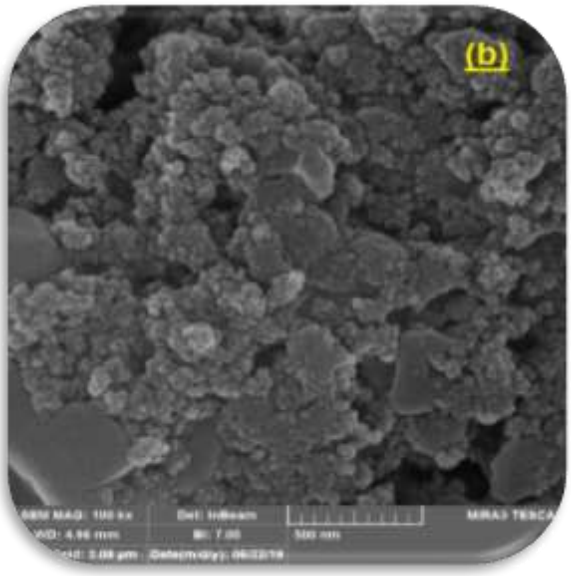


Figure (3) Infrared Spectrum (FT-IR) of the Comp.2

SEM images of compound 2 showed nanometers of up to 15.11 nm (a) as well as a similarity in morphology of semi-deformed grains (b) with the appearance of sheets decorated with random spread (c) (d).





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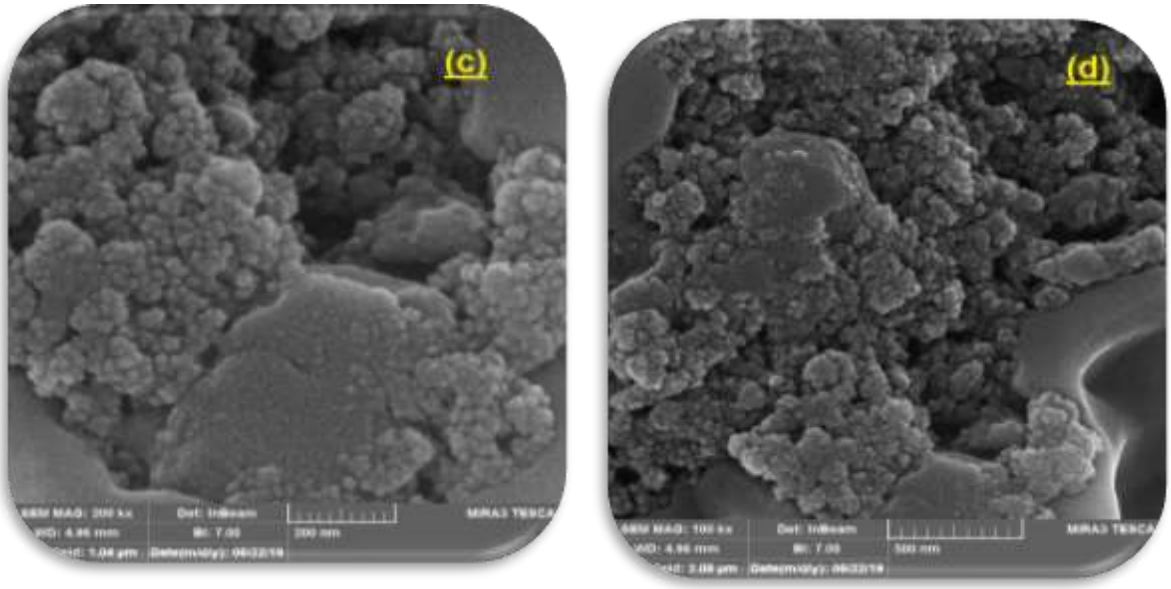


Figure (4) Pictures (SEM) of Comp. 2 (a, B, C, D)

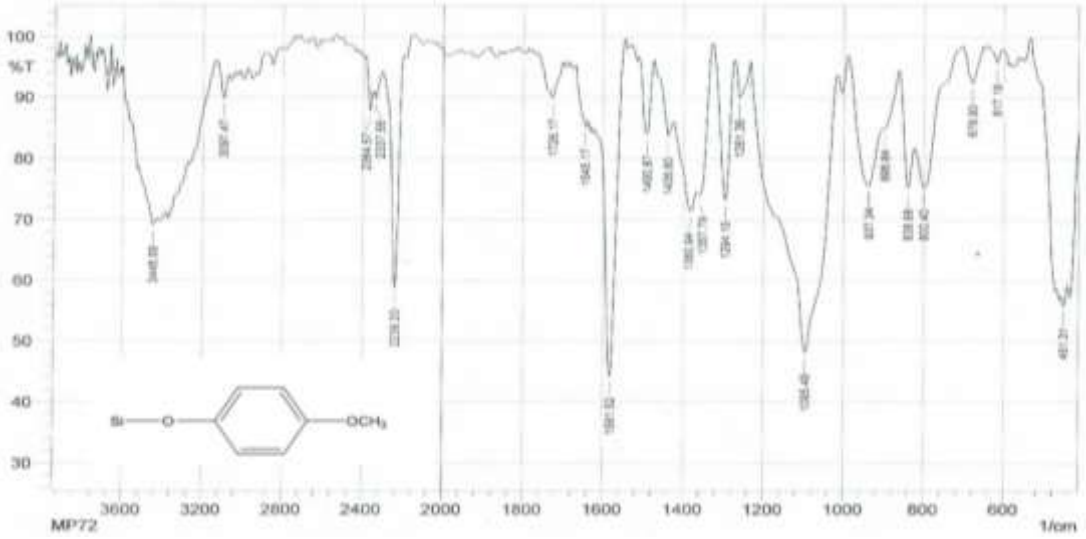
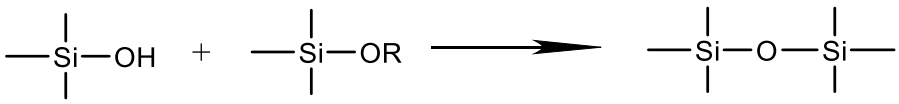


Figure (5) Infrared Spectrum (FT-IR) of the Comp. (3)

The SEM images of Compound 3 were nanometrics up to 25.23 nm (a) with the emergence of organic forms of their crystals (b) and may be due to the easy reaction of compensation, which leads to an expected increase in the size of silica crystals.



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It also refers to the surface fine crystals scattered in diameters of (2-10) nm (c), and may be attributed to phenol molecules formed as a result of the reaction above, a phenomenon that is not present in samples compensated by driving groups OH or OR compounds 1,2 .

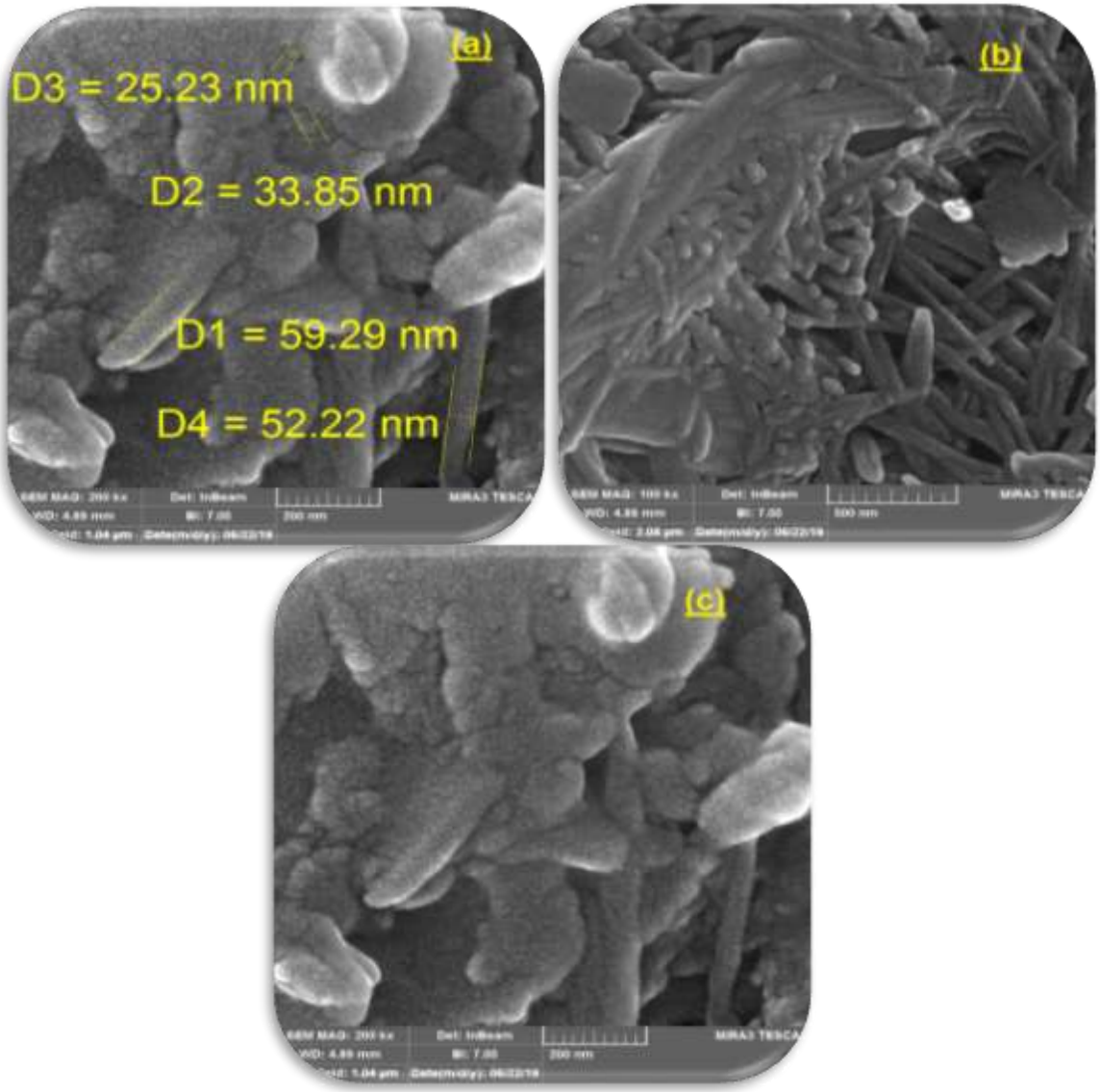

Figure (6) Pictures (SEM) 3 (a, b, c)

It was noted that the roughness of Comp. 1,2 and 3 was in an upward sequence, with Comp. 1 (124 nm) and in Comp.2 (261 nm) and Comp.3 (374 nm).

The low roughness of compound 1 compared to other compounds has been synthetically attributed to the presence of hydroxy aggregates with the ability to form hydrogen bonds between layers, which increase their relative convergence, which as a result leads to a decrease in surface roughness and an increase in granular size ; while compound 2 has increased roughness despite the decrease in granular volume, which may be due to additional peeling, which has been helped by the nature of the unreachable ring.

Compound 3 showed the highest amount of roughness between the compounds and was attributed to the nature of the compensated methoxy group, which is believed to be increase class

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spacing and roughness, although it could not play a similar role as Compound 2 in increasing peeling of the mother compound during the reaction, as well as the highest peak and lowest bottom of the amount of such roughness according to the sample selection section. Table 2 and shape.(7)

Table (2) shows roughness ratio and granular size of compounds (1-3)

Compound	MPD, nm	MPH, nm	D, nm	RMS, nm
1	292	706	20.03	124
2	261	675	15.11	261
3	33	1000	25.23	374

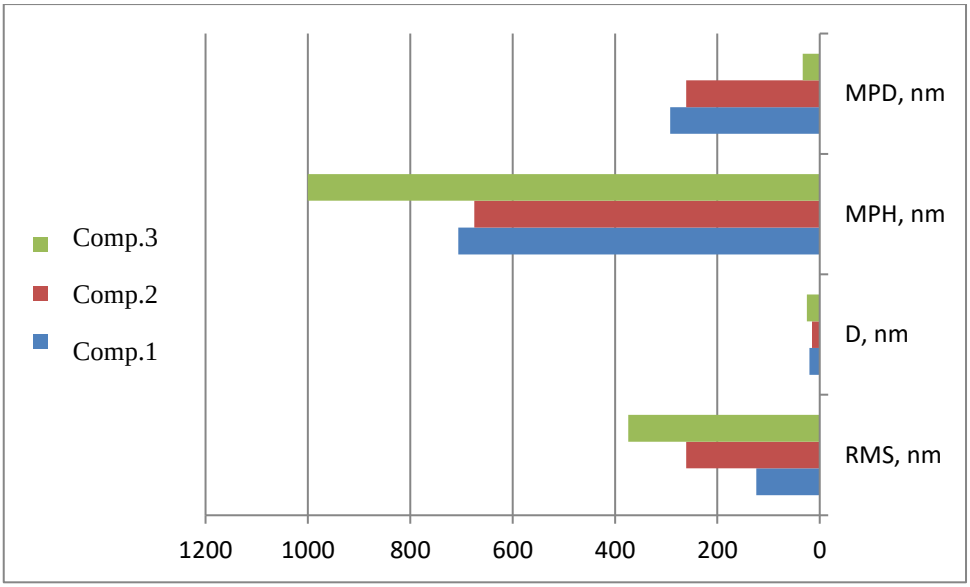

Figure (7) shows the roughness and granular size of the compounds (1-3)

Where: Granular size: D/ top of roughness: MPH/ (lowest) bottom of roughness: MPD/roughness ratio: RMS

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