

إِسْتَفْتَحَ

قال تعالى:

وَعَجِزْتُ إِلَيْكَ رَبُّ لِتَرْضَنِي

صدق الله العظيم

سورة طه الآية (84)



Dedication

To my

Parents

Brother

Sister

Acknowledgment

I would like to thank to Allah, Almighty, for given me the strength and good health while doing this work.

I would to Thank for Dr. Mohammed Suleiman Ali Eltoum, my supervisor,
who never failed to guide me.

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Abstract

Tetraethyl orthosilicate (TEOS) was synthesized by chemical methods from silicon dioxide and diethyl ether using acid catalyst of hydrochloric acid (11.8M) by two methods, direct method and by using copper oxide supported on silica catalyst. The sol gel process was applied for the preparation of nano silica gel. This method involves hydrolysis and condensation reaction of TEOS, the mechanism of this method was explained and show formation of a network Si-O-Si chemical linkage from the alkoxysilane, the yield of tetraethylorthosilicate was characterized by Fourier transform-Infrared (FT-IR) spectroscopy, the results indicating that, the bond of Si-O-Si successfully formed. Finally the comparison between two methods was studied and results show that, the rate of reaction of TEOS which prepared by direct method was equal to 10.008g/sec and that which prepared by using catalyst was equal to 0.27g/sec, this indicating that, the tetraethylorthosilicate which prepared using catalyst was better than that prepared by direct method.

المستخلص

تم تخليق مركب أورثو سليكات الصوديوم من مركب ثنائي أيثيل إيثر وثنائي أكسيد السليكون النقي عن طريق الحفز في وسط حمضي (حمض الهيدروكلوريك 11.8م) وتم ذلك بطريقتين الطريقة المباشرة والطريقة الغير مباشرة باستخدام حفاز من أكسيد النحاس المدعم بالسليكا وتم تطبيق طريقة السول جل لتكوين النانو سليكا جل والتي تتضمن تفاعلات الإماهة والتكاثف وشرحت الميكانيكية لهذا التفاعل والتي أظهرت تكوين رابطة السليكوسين وقد تم تشخيص المركب الناتج باستخدام طيف الاشعة تحت الحمراء ودلت النتائج المتحصل عليها علي تكوين رابطة السليكوسين أيضا. أخيرا تم إجراء مقارنة بين كلا من الطريقتين ودلت النتائج المتحصل عليها ان تخليق مركب أورثو سليكات الصوديوم باستخدام الحفاز أفضل من إنتاجه بالطريقة المباشرة.

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