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Author

Date:

Thursday, 17 May 2018

Laboratories, Keele University Science Park, Keele, Staffordshire.

Title:

Infra-Red Analysis of Two Forms of Calcium Sulfate Bone Void Filler

Study Summary

Two samples of calcium sulfate bone void filler received. Investigate material properties through Fourier Transform Infra-Red (FTIR) Analysis.

Sample Name	Ref	Lot	Appearance
Syntheticure	20-125	RM118904	White Powder, clear liquid
Stimulan Rapid Cure	620-005D	2018-03a	White Powder, clear liquid

Analytical Methods and Results

The FTIR experiments were carried out on the samples as formed into beads according to the relevant Instructions For Use (IFU).

Sample Preparation

0.001g of one batch of each sample was combined with 0.2g potassium bromide (KBr) powder (p/n 3610, Specac) and finely ground. Powder was pressed into a disc at a force of 10 tons under vacuum using a Specac press (Bio number 438).

Disc samples analysed using Avatar 370 FTIR (Thermo Nicolet s/n AFQ0300674).

Results

Both peaks appear similar indicating that both samples formed into set beads are calcium sulfate dihydrate (gypsum). This is identified by the presence of two IR peaks for O-H bending vibration modes (1682, 1619 cm⁻¹) indicating that there are two crystallographic distinct types of water. One type of water is linked with sulfate ions by hydrogen bonding, and the corresponding peak has lower frequency and high intensity. The other peak is directly linked to calcium ions.

The corresponding traces are shown in figure 1.

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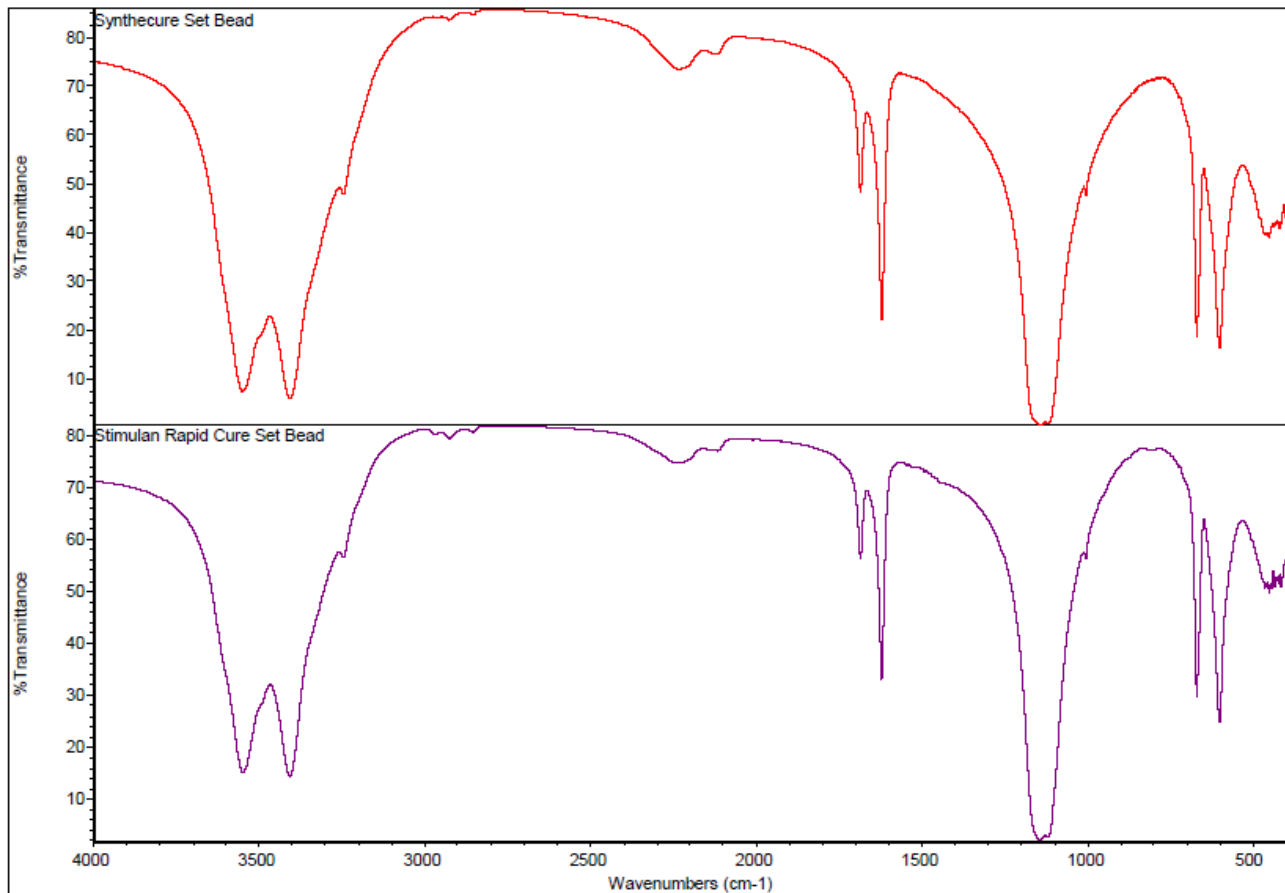
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Fig 1



Conclusions

Both samples as set are confirmed by FTIR as calcium sulfate dihydrate (Gypsum).