

FTIR spectroscopic study of an organic/mineral composite for bone and dental substitute materials.

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► **To cite this version:**

Pierre Weiss, Mieczyslaw Lapkowski, Raquel Legeros, Jean-Michel Bouler, Alain Jean, et al.. FTIR spectroscopic study of an organic/mineral composite for bone and dental substitute materials.. J Mater Sci Mater Med, 1997, 8 (10), pp.621-629. 10.1023/A:1018519419539 . inserm-00143559

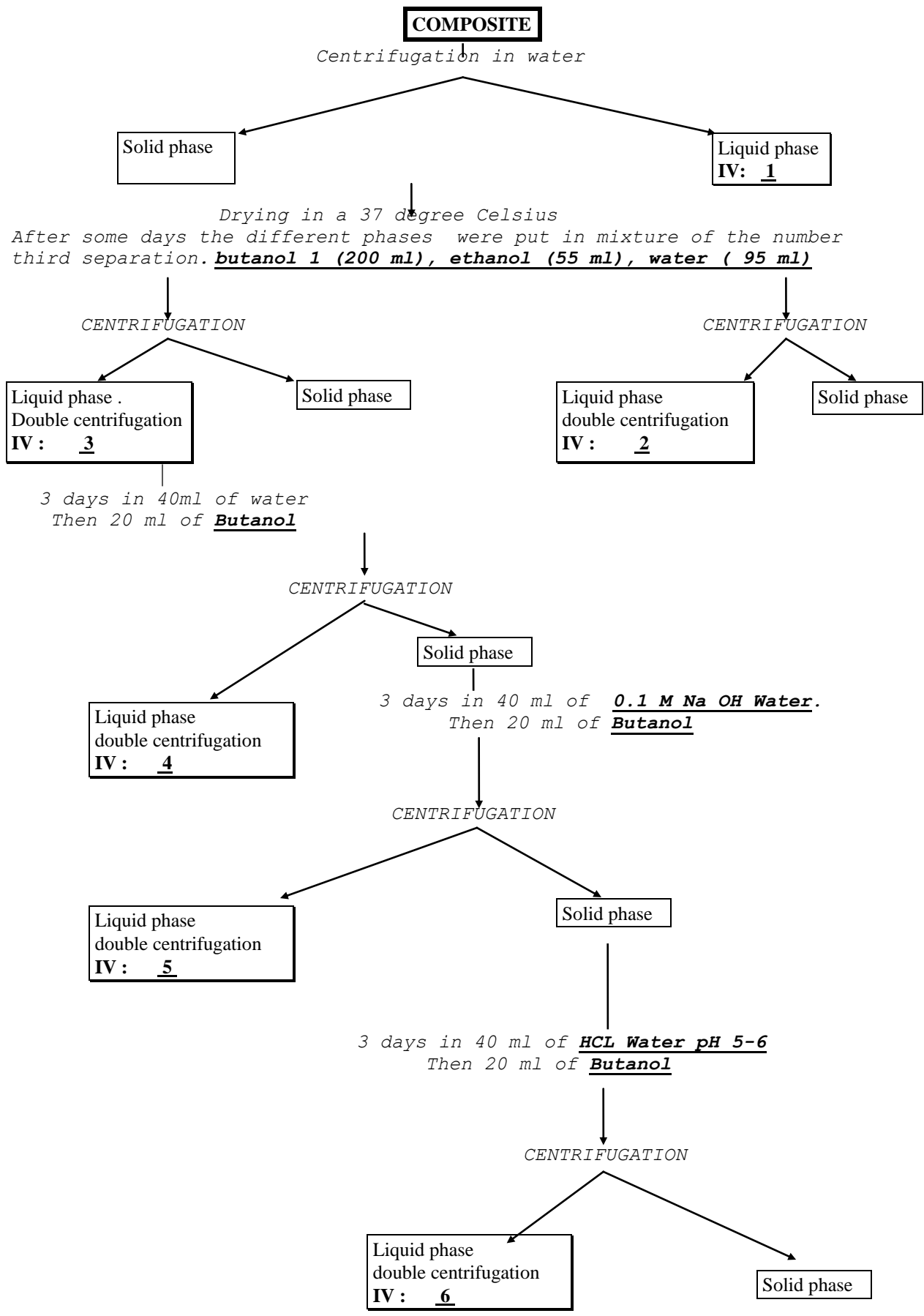
HAL Id: inserm-00143559

<https://www.hal.inserm.fr/inserm-00143559>

Submitted on 26 Apr 2007

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| <i>PEAK</i> | <i>Possible assignments</i> | <i>References</i> |
|-------------|---|-----------------------|
| 712 | Peak of carbonates --> MINERAL | 11 |
| 870- 874 | absorption of C-O in CO ₃ ²⁻ --> MINERAL | 13 -11 |
| 1000-1200 | C-O alcohol and C-O-C ---> ORGANIC | 15 - 14 -19 - 18 - 20 |
| 1225-1235 | Vib de def plane de OH et COOH | 15 |
| 1250-1500 | CH ₂ CH ₃ ----> ORGANIC | 14 -18 - 16 - 15 |
| 1360 - 1450 | Weaker symmetric COO stretching vibration | 14 |
| 1410 - 1420 | absorption of C-O in CO ₃ ²⁻ --> MINERAL | 13 - 11 -12 |
| 1460 | absorption of C-O in CO ₃ ²⁻ --> MINERAL | 13 - 12 |
| 1540 - 1650 | Strong asymmetric COO ⁻ stretching vibration | 14 |
| 1550 -1900 | C=O | 14 |
| 1563 - 1667 | Stretching vibrations of the COO ⁻ | 20 |
| 1592 | COO ⁻ Salt formation | 20 |
| 1667-1724 | Carbonyl C=O Oxidation | 20 |
| 1724 - 2000 | C=O stretching | 20 - 15 |
| 1795 | small peak of carbonates --> MINERAL | 11 |
| 1754 | C=O monosaccharides | 18 |
| 2700 - 3000 | CH CH ₂ CH ₃ ----> ORGANIC | 17- 15 - 14 - 18 |

| Minerals fillers | pH |
|-------------------------|-----------|
| BCP 1 | 11 |
| BCP 1 W | 9-10 |
| BCP 2 | 6 |
| HA | 8 |
| OHAP | 10 |

| pH/medium | T0 | T1 | proton consumption mol.l ⁻¹ |
|--------------------------|-------|-------|--|
| water | 9,03 | 9,00 | -6,64E-11 |
| BCP 1g/20ml | 8,77 | 10,62 | 1,68E-09 |
| Ca(OH) ₂ 0.1M | 11,96 | 12,40 | 6,86E-13 |
| NaOH 0.1M | 11,62 | 12,48 | 2,06E-12 |
| NaOH 1M | 13,00 | 13,17 | 3,27E-14 |

| Presence of | T0 | | | T1 | | | T2 | | |
|-------------|------------------------|------------|-----------------|------------------------|------------|-----------------|------------------------|------------|-----------------|
| | <u>COO⁻</u> | <u>C=O</u> | <u>Mineral*</u> | <u>COO⁻</u> | <u>C=O</u> | <u>Mineral*</u> | <u>COO⁻</u> | <u>C=O</u> | <u>Mineral*</u> |
| BCP | No | No | Yes | Yes | Yes | No | Yes | Yes | Yes |
| HA | | | | No | Yes | No | No | Yes | No |
| OHAP | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |

* CaCO₃

| separation number: | | IV- 1 | IV- 2 | IV- 3 | IV- 4 | IV- 5 | IV- 6 | |
|-----------------------------|--------------|--------------|-----------------------------|-----------------------------|-----------------|-----------------------------|---------------------------|--------------|
| FILLERS | TIMES | Water | Mixture of alcohols + water | Mixture of alcohols + water | Butanol + water | Butanol + alkaline solution | Butanol + acidic solution | TOTAL |
| BCP 1 pH :11 | T0 | Yes | | Yes | Yes | Yes | No | 4/5 |
| | T3 | | Yes | No | Yes | Yes | Yes | 4/5 |
| BCP 1 W pH : 9-10 | T2 | | Yes | Yes | Yes | Yes | No | 4/5 |
| BCP 2 pH : 6 | T1 | | No | No | No | Yes | No | 1/5 |
| HA pH : 8 | T3 | | No | No | | Yes | No | 1/5 |
| OHAP pH : 10 | T0 | Yes | | Yes | Yes | Yes | No | 4/5 |
| | T3 | | No | No | Yes | Yes | Yes | 3/5 |
| TOTAL | | 2/2 | 2/5 | 3/7 | 5/6 | 7/7 | 2/7 | |

| PRESENCE OF COO PEAKS | | | | |
|------------------------------|----|----|----|----|
| | T0 | T1 | T2 | T3 |
| BCP 1 | 0 | | | 1 |
| BCP 1 W | | | 0 | |
| BCP 2 | | 0 | | |
| HA | | | | 1 |
| OHAP | 0 | | | 3 |

| PRESENCE OF C=O PEAKS | | | | |
|------------------------------|----|----|----|----|
| | T0 | T1 | T2 | T3 |
| BCP 1 | 1 | | | 2 |
| BCP 1 W | | | 3 | |
| BCP 2 | | 4 | | |
| HA | | | | 2 |
| OHAP | 4 | | | 4 |