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- ature below 400° C. to convert said iron to a ferri-  
magnetic state; and
- d) after exposing said product to said oxidizing agent,  
contacting said product with a reducing agent to  
convert said iron to a paramagnetic state, wherein 5  
said reducing agent is hydrogen gas and water.
- 2. The process of claim 1, wherein said silicon alkox-  
ide is a tetraalkylorthosilicate.
- 3. The process of claim 1, wherein said iron com-  
pound is ferric nitrate. 10
- 4. The process of claim 2, wherein said tetraalkylor-  
thosilicate is tetraethylorthosilicate.
- 5. The process of claim 1, wherein said process fur-  
ther comprises forming said bulk material into a shaped  
monolith. 15
- 6. The process of claim 1, wherein said oxidizing  
agent comprises oxygen.
- 7. The process of claim 1, wherein said polymerizing  
is conducted in the presence of a catalyst. 20
- 8. The process of claim 7, wherein said catalyst com-  
prises HF.
- 9. A process for synthesizing a bulk material having  
magnetic particles dispersed in a non-magnetic matrix,  
comprising the steps of: 25
  - a) polymerizing silicon alkoxide in solution with at  
least one iron compound to form a gel;

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- b) curing said gel to form a porous hydrolyzed silicon  
product which contains iron;
- c) subsequently contacting the porous hydrolyzed  
silicon product with a reducing agent at a tempera-  
ture below 400° C. to convert said iron to a super-  
paramagnetic state; and
- d) after contacting said product with said reducing  
agent, contacting said product with a nitriding  
agent to convert said iron to a ferromagnetic state.
- 10. The process of claim 9, wherein said reducing  
agent is hydrogen.
- 11. The process of claim 9, wherein said nitriding  
agent comprises ammonia.
- 12. The process of claim 9, wherein said silicon alkox-  
ide is a tetraalkylorthosilicate.
- 13. The process of claim 12, wherein said tetraalk-  
ylorthosilicate is tetraethylorthosilicate.
- 14. The process of claim 9, wherein said iron com-  
pound is ferric nitrate.
- 15. The process of claim 9, wherein said polymerizing  
is conducted in the presence of a catalyst.
- 16. The process of claim 15, wherein the catalyst  
comprises HF.
- 17. The process of claim 9, wherein the process fur-  
ther comprises forming said bulk material into a shaped  
monolith.

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