Treatment of Glass Spheres for Lower Cost Proppants

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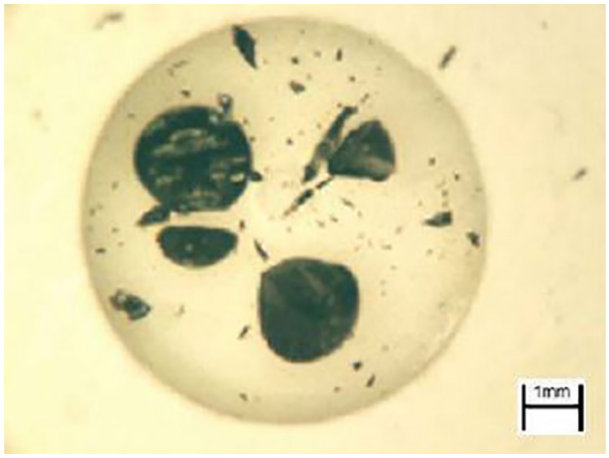

Proppants Fail into Larger Fragments

Technology Summary

The disclosed invention details a process using molten salt ion exchange to process silica-based glass spheres, altering the residual stress state and flaw population. This process tailors the mechanical properties, failure mechanisms and the resultant fragment morphologies for enhanced service performance. The spheres are to be used primarily as proppants in hydrofractured oil and natural gas wells. The process outlined here mitigates the propensity of conventional glass spheres to fail energetically and catastrophically into fine particulates under multiaxial compressive loading, thereby resulting in enhanced permeability and extraction efficiency in packed proppant beds.

Application & Market Utility

Produces proppants analogous to existing materials using substantially cheaper raw materials and processing routes – recycled glass cullet, for example, might be used. Deviates from the typical high-energy failure of amorphous glass, meaning particles may fail without blinding the packed bed of proppants. Heat treatments involve lower temperature and shorter times than current energy-intensive solutions.

Next Steps

Patent 8,193,128 has issued. Seeking licensing opportunities.

TECHNOLOGY READINESS LEVEL 1-3

Seeking

Investment | Licensing | Research

Keywords

- hydrofracturing
- proppants
- oil/gas well production
- fracking
- mining

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