

Table 4. A comparison between solution combustion and Merzhanov's SHS.

SHS	Solution combustion
Gasless solid state (i.e. solid → solid) process	Gas-producing solution (i.e. solution → solid) process
Heterogeneous	Homogeneous or heterogeneous
Flame temperature > 2000°C	Flame temperature ≥ 1000°C
Self-propagating only if the adiabatic temperature (T _{ad}) is > 1800°C	Self-propagating even when the flame temperature > 900°C
Powders could be sintered to high density by simultaneous application of pressure	Compacted and sintered to near theoretical density at low temperatures
Commercialized	Yet to be commercially exploited

size and occupy the grain boundaries of large alumina grains. Microstructure of PZT (figure 1d) also shows uniform grain growth with an average grain sizes of 2 μm.

4. Conclusions

The combustion process described here has several advantages over the other methods in terms of simplicity, cost effectiveness, energy saving, purity and homogeneity. The main differences between Merzhanov's SHS and the combustion process described here (solution combustion) are given in table 4.

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