# PHT polyhexahydrotriazine

| PARAMETER | UNIT | VALUE | REFERENCES |
|---|---|---|---|
| **GENERAL** | | | |
| **Common name** | - | polyhexahydrotriazine | |
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| **HISTORY** | | | |
| **Person to discover** | - | Jeanette Garcia, IBM | Garcia, J M; Jones, G O, Virvani, K; McCkey, B D; Boday, D J; ter Huurne, G H; Horn, H W; Coady, D J; Bintaleb, A M; Alabdulrahman, A M S; Alwailem, F; Almegren, H A A, Hedrick, J L, Science, 344, 6185, 732-5, 2014. |
| **Date** | - | May, 2014 | |
| | | | |
| **SYNTHESIS** | | | |
| **Method of synthesis** | - | a reaction of paraformaldehyde and 4,4-oxydianiline | |
| **Temperature of polymerization** | °C | 50-185 | |
| **Time of polymerization** | min | 10-30 | |
| | | | |
| **PHYSICAL PROPERTIES** | | | |
| **Color** | - | yellow | |
| **Decomposition temperature** | °C | 300 | |
| **Glass transition temperature** | °C | 190 | |
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| **MECHANICAL & RHEOLOGICAL PROPERTIES** | | | |
| **Young's modulus** | MPa | 10,000 | |
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| **CHEMICAL RESISTANCE** | | | |
| **Other** | - | stable to solvents at pH>3 | |
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| **PROCESSING** | | | |
| **Typical processing methods** | - | | Hedrick, J L; Horn, H W; Jones, G O; O'Brien, J M; Virwani, K R, US Patent 20150104579, WO2015051715, IBM. |
| **Outstanding properties** | - | strongest thermosetting plastics, self-healing (forming spontaneous bonds between ruptured and damaged polymeric links, deep razor cut heals itself in 2 hours), recyclable (thermoset!!), dipped in sulfuric acid reverts to viscous state from which material can be remolded | |
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