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Plasma Chemistry of Synthesis and Conversion of Energetic Materials

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Presentation reviews latest results obtained in Nyheim Plasma Institute of Drexel University on plasma-chemical processes of fuel conversion and synthesis of energetic materials in non-thermal discharges. Major discharges in focus are:

1. Non-equilibrium gliding arcs stabilized in reverse vortex Tornado flow
2. Micro- and nanosecond pulsed dielectric barrier discharges
3. Cold and transitional discharges in liquids

Major specific plasma-chemical processes in focus are:

1. Methane conversion in mixture with different gases
2. Methane (natural gas) direct liquefaction process
3. Liquid-phase synthesis of polymeric nitrogen compounds

Mechanisms of the plasma-chemical processes are discussed as well as physical and chemical kinetics of the processes in strongly non-equilibrium conditions