

## OP 178

### Factors affecting the integrity of pipelines transporting hydrogen containing media

**Judit Kovács**, János Lukács

*University of Miskolc, Miskolc, Hungary*

Pipeline transport of hydrogen is one of the challenges of our time, whether it is hydrogen blended into natural gas or pure hydrogen. Given the economic and environmental interest in using an existing natural gas transmission system for this purpose, it is worthwhile to take into account the factors affecting the integrity, through their investigation possibilities. The typical damage mode, the hydrogen embrittlement, can be investigated with the help of the following methods: standard tensile test; Slow Strain Rate Test (SSRT); fracture toughness tests; High Cycle Fatigue (HCF) tests; Fatigue Crack Growth (FCG) tests; full-scale pipeline section tests; microstructural analyses. For each method, characteristics can be associated expressing the resistance to damage and give possible way for the ranking of the materials and their welded joints. The applicability of the characteristics will be demonstrated for API 5L grade steels of different strength categories by processing a statistically meaningful amount of data.