

## Metrological Characterization of Biofuels by Means of Speed of Sound Measurements

Simona Lago<sup>C, S</sup> and P. Alberto Giuliano Albo  
*INRiM, Thermodynamics Division, Turin, Italy*  
*s.lago@inrim.it*

As a part of an ongoing European Project, called “Metrology for Biofuels”, aimed at characterizing liquid biofuels, providing validated and reliable methods with ensured traceability of the measurement results for their physical and chemical parameters, a metrology infrastructure results of prime importance to consolidate a sustainable contribution of biofuels to the European energy supply sources. In this context, the Italian Institute of Metrological Research (INRiM) has carried off a speed of sound measurements cycle that, together with density data, has been useful to obtain a complete thermophysical characterization of liquid biofuels under study. In particular, in this work, it is reported a new application of Recursive Equation Method (REM) that permits the development of an accurate empirical EoS, only by means of speed of sound  $u(T,p)$  and density  $\rho(T,p)$  as functions of temperature and pressure. As a consequence, the isobaric specific heat capacity  $c_p(T,p)$  values of soybean oil methyl ester (SME) and rapeseed oil methyl ester (RME) samples have been calculated in a wide  $T$ - $p$  range.