

Thermal Diffusivity and Microstructure in API5L-X52 Carbon Steel¹

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The determination of the thermal diffusivity of API5L-X52 carbon steel at room temperature, by means of the photoacoustic technique in a heat transmission configuration, is reported for the first time. Since literature values of thermal diffusivity for this low carbon steel do not exist, comparisons among our thermal diffusivity (α) results for API5L-X52 steel and those reported in the literature for steels with similar compositions are reported. Moreover, a study of the microstructure of this low carbon steel by means of scanning electronic microscopy (SEM) and X-ray diffraction (XRD) is presented.

KEY WORDS: API5L-X52 carbon steel; microstructure; thermal diffusivity.

1. INTRODUCTION

A knowledge of the physical and chemical properties of materials and the relations among them is of interest in the selection of materials that will be used in the design and manufacturing of pipelines with specifications for installation, operation, and maintenance of fluid transportation. Studies of the relations between mechanical and thermal properties have been of interest to the steel and metal industries; these include studies about the

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