Abstract
Laser shock processing (LSP) was performed on naval brass alloy specimen to reveal effectiveness on fatigue life. LSP experimental array was performed as follows: A convergent lens was used to deliver ٠,٥-١ J/pulse (١٠٦٤ nm). In a ١٠ ns, laser FWHM pulse produced by Q-switched Nd:YAG laser of ٦ Hz with spots of ٠,٥-٢ mm in diameter moving forward along the work piece with pulse density of ٥٠٠ pulses/cm٢. Deionized water (٣ mm thickness) was used as a transparent confining layer while the non-prate black paint (٢٠ μm thickness) was used as an absorbing layer of laser beam. The optimum values of ١mm spot size, pulse energy of ١ J. LSP effective parameters, microstructure and fatigue life test were evaluated. Chemical composition analysis was conducted. The microstructure analysis included surface morphology by SEM, grain analysis by AFM. The results demonstrated that the LSP can be improving fatigue resistance for specimens which were used in this work by comparing with the untreated specimens. The fatigue life's of the specimens after LSP was obviously increased by ٦٤٪ at lower stress level due to the compressive residual stresses near the surface.