

الآية

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 انْفُخُوا ^{صَلِّ} حَتَّىٰ إِذَا جَعَلَهُ نَارًا قَالَ
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ABSTRACT

Rapid wear of drilling bits in oil exploration companies occur due to friction with the sand in mud layers, this wear causes the drilling bits to consume in large quantities and leads to frequent breakdowns of drilling processes. Exploration companies are continuously suffering of these annual losses.

This investigation was conducted to improve the mechanical properties of the drilling bit, it subjected to packed carburization treatment. The experimental studies were conducted under various quenching media, carburizing and tempering temperatures. The settings of carburization parameters were determined by using the Taguchi experimental design method to minimize the number of experiments. The level of importance of the carburization parameters on hardness is determined by using analysis of variance (ANOVA). The optimum combination of carburization parameter was obtained by using the analysis of signal-to-noise (S/N) ratio. The confirmation tests indicated that it is possible to increase hardness significantly by using carburization process. Based on the carburization result from Taguchi method the optimum surface hardness value calculated is 44.17HR.

الخلاصة

التآكل السريع لسكينة الحفر في شركات تنقيب البترول يحدث نتيجة للإحتكاك مع حبيبات الرمل في طبقات الأرض الطينية. وهذا التآكل يتسبب في استهلاكها بكميات كبيرة مما أدى لإعطال متكررة لآليات الحفر. وهذه عبارة عن خسائر سنوية تعاني منها الشركات في هذا المجال. تُقدم هذه الورقة البحثية إجراء لمعالجة الخواص الميكانيكية لسكينة الحفر بإستخدام عملية الكربنة. وقد تم إجراء الدراسات تحت أوضاع مختلفة وذلك بتغيير وسائط التبريد و درجات حرارة الكربنة ودرجات حرارة التطبيع. وتم تحديد عوامل الكربنة لتقليل عدد التجارب بواسطة نظرية تصميم التجربة والمصفوفات المتعامدة في طريقة تاجوشي. أما درجة أهمية عوامل الكربنة علي الصلابة فقد تم تحديدها بواسطة تحليل التباين. أما التوليفة المثلي لعوامل الكربنة فتم إيجادها بتحليل نسبة الإشارة الي الضجيج. وقد أظهرت التجارب السابقة إمكانية زيادة الصلابة بشكل ملحوظ بواسطة عملية الكربنة. بناءً على نتائج الكربنة بطريق تاجوشي نجد ان 44.17 تمثل أفضل قيمة للصلادة في هذه الدراسة .

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