1023-05-975 **Stephen G. Hartke*** (`hartke@math.uiuc.edu`), Dept of Mathematics, University of Illinois at Urbana-Champaign, 1409 W. Green Street, Urbana, IL 61801-2943. *DNA Codewords and De Bruijn Sequences.* Preliminary report.

A De Bruijn sequence is a cyclic string of length n over some alphabet S such that all of the substrings of k consecutive letters are distinct under some natural equivalence relation. Given S and k, the motivating question is to find a maximum length De Bruijn sequence. Sixty years ago, De Bruijn proved that a De Bruijn sequence of length $|S|^k$ exists when the equivalence relation is straight equality.

When the alphabet is $S = \{A, C, G, T\}$, De Bruijn sequences are useful for the design and testing of DNA codewords. Since DNA can twist back on itself, we require the k-substrings to be distinct not only under equality but also reverse complementation. Results will be presented on the maximum length of a De Bruijn sequence with this equivalence relation. (Received September 24, 2006)