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)