Condensations

Sodium hydride in oil resembles sodium and sodium alcoholates in its ability to function as a deprotonating agent in the Acetoacetic ester, Claisen, Stobbe, Dieckmann, and related condensations.

The marked advantages over other condensing agents are:

1. it is a stronger base, which results a more straightforward deprotonation
2. no excess is needed
3. alcoholates add an alcohol to the reaction mixture, which may need to be distilled out to drive the condensation equilibrium – NaH results in only H2 gas as a reaction by-product
4. the evolving H2 gives a measure of the extent of the reaction.
5. side reactions such as reductions are eliminated

Alkylations - Alkylations of aromatic and heterocyclic amines such as 2-aminopyridine and phenothiazine are readily accomplished in high yield using toluene-dimethylformamide mixtures. The dimethylformamide concentration is a variable used to control the rate of reaction.

Polymerization - Several literature examples indicate the usefulness of sodium hydride in polymerization to form caprolactams and glycol ethers.