

11.D5 This question asks for us to decide whether or not it would be advisable to hot-work or cold-work several metals and alloys.

Platinum is one of the noble metals. Even though it has a high melting temperature and good resistance to oxidation, at room temperature it is relatively soft and ductile, and is amenable to cold working.

Molybdenum, one of the refractory metals, is hard and strong at room temperature, has a high recrystallization temperature, and experiences oxidation at elevated temperatures. Cold-working is difficult because of its strength, and hot-working is not practical because of oxidation problems. Most molybdenum articles are fabricated by powder metallurgy, or by using cold-working followed by annealing cycles.

Lead would almost always be hot-worked. Even deformation at room temperature would be considered hot-working inasmuch as its recrystallization temperature is below room temperature (Table 7.2).

304 stainless steel is relatively resistant to oxidation. However, it is very ductile and has a moderate yield strength (Table 11.4), therefore, it may be cold-worked, but hot-working is also a possibility.

Copper is relatively soft and very ductile and ductile at room temperature (see, for example, C11000 copper in Table 11.6); therefore, it may be cold-worked.