

## Asynt CondensSyn Evaluation

### Solvent tests to compare the Asynt CondensSyn air condenser with the Liebig water condenser

**Asynt CondensSyn** – This is an air condenser designed by Asynt to be used instead of a conventional water condenser and is claimed to perform to the same standard as the Liebig condenser. The use of such air condensers eliminates the need of water, and thus helps to reduce the environmental impact and negate the risk of flooding found in conventional water condensers. The air condenser is also designed to have a large surface area to aid condensation.

### Results

The air condenser (35 cm in length) and the water condenser (30 cm in length) used in these tests was equipped with a B24 connection. Solvent tests were completed on 50 and 100 gram scales in either 100 or 250 mL flasks with the desired condenser (Figure 1) for 15-17 hours. Asynt DrySyn blocks were used on either Heidolph or Asynt hotplates, which were equipped with temperature probes. The results of the solvent studies are listed below (Table 1).



**Figure 1.** Water condenser (left) and CondensSyn (right) in use

When water condensers (odd entries: 1,3,5,7) were used, apart from the acetone test (entry 7), they outperformed the CondensSyn (even entries: 2,4,6,8) in terms of the percentage of solvent lost over the time period. That is not to say that the CondensSyn is not up to the desired standard, as even though it lost more solvent than its counterpart all tests still showed  $\leq 10\%$

loss of solvent. In the acetone tests (entries 7, 8), both condensers resulted in a similar loss of solvent and this is the only time the percentage loss was comparable.

Entry	Solvent	Condenser	BP (°C)	DrySyn block (°C)	flask (mL)	Starting weight (g)	time (hrs)	End weight (g)	% loss
1	Dichloromethane	Water	40	50	250	100.2	15	95.9	4.3
2		Asynt air				100.0	17	90.0	10
3	Toluene	Water	110	130	250	105.0	15	104.8	0.2
4		Asynt air			100	50.1	17	48.3	3.6
5	THF	Water	66	80	100	51.5	16	51.1	0.8
6		Asynt air				50.4		49.0	2.8
7	Acetone	Water	56	70	100	50.8	16	46.1	9.3
8		Asynt air				51.2		46.4	9.4

**Table 1.** Results of the solvent tests

## Conclusion

Despite the fact that the water condenser resulted in a lower percentage loss of solvent with 3 different solvents (dichloromethane, toluene and THF) and an equal loss with acetone compared to the CondenSyn, I strongly believe that the CondenSyn remains a highly attractive and viable option for use as an alternative to water condensers. Particularly when taking into account factors like; the cost of the water for running the reactions overnight and the heightened risks, such as potential flooding. Aside from these environmental and financial benefits, the CondenSyn enables the user to set up the reaction anywhere in the fumehood without the need to be close to a water source and without bulky tubing. Given the scale I most often work on (milligram scale), I would happily use this on a regular basis if a B14 air condenser became available.